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WILLIAM S. WHITING LOGGING RAILROADS  
AN HISTORICAL GEOGRAPHY 1900-1925

A Thesis

by

JOSEPH H. QUINN JR.

Submitted to the Graduate School

Appalachian State University

in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

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APPALACHIAN COLLECTION  
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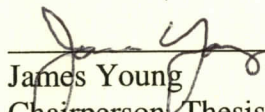
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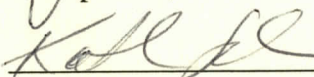
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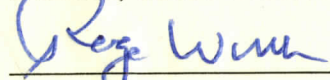
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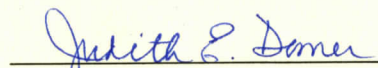
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## ABSTRACT

### WILLIAM S. WHITING LOGGING RAILROADS

#### AN HISTORICAL GEOGRAPHY 1900-1925

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Thesis Chairperson: Dr. James Young

By 1920, William S. Whiting's Boone Fork Lumber Company at Shulls Mills, North Carolina, was operating at full capacity. A large bandsaw mill complex was served by two spur logging rail lines reaching extensive timber holdings. Lumber products were shipped via the narrow gauge mainline Linville River Railway to Elizabethton, Tennessee and to regional markets on standard gauge mainline systems from there.

William S. Whiting was one of the Pennsylvania lumber barons of the late nineteenth century. Whiting's Boone Fork Lumber Company operations came relatively late in his efforts and in the general logging era of the southern Appalachian region. Timber serving the Shulls Mill site was among the last to be accessed in the southern Appalachians due to challenges posed by the physical geography of the region. These topographic challenges also hindered the development of transportation in the region; the application of narrow gauge railroad technology to this environment enabled the exploitation of the remaining timber reserves of the eastern United States.



## DEDICATION

This paper is dedicated to Joe Quinn.

Many thanks to wife Dale Harrington, children Josh Dockery and Susan Dockery,

Ian Snider, brothers Bob Quinn and Tom Quinn, and my mother, Ann Quinn.



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## Chapter 1: Introduction

The historical geography of northwest North Carolina is rich and well-documented (Arthur 1914; Vance 1932; Cooper 1964; Cooper 1997). The interactions of humans with the landscape are manifest in various land-use patterns of settlement and habitation, agriculture, industrial development, and transportation systems. A significant aspect of this region's history and geography is that of the timber industry and lumbering, especially during the late nineteenth and early twentieth centuries. The lumber business, from logging of hardwoods to providing finished building material, has been an important industry in the history and development of the southern Appalachian region.

Transportation geography connects human activities and movement with the physical landscape. Transportation has two distinct aspects shown by characteristics of location and use. Railroads are a principal factor influencing the distribution of basic economic activities. A now defunct and forgotten system of rail lines made up a key transportation network that was an essential part of the timbering activity and consequent lumber industry in northwest North Carolina.

Throughout northwest North Carolina, roads and highways now occupy most of the old railroad beds. Other railroad grades exist in obscurity, often parallel to existing motor roads in primary transportation corridors. Still other railroad routes are utilized as parts of non-motorized trail systems. All three conditions exist for the route of a narrow-

gauge railroad system built between 1915 and 1920 by lumberman William S. Whiting. The railroad hauled logs cut from his timber holdings in Watauga County.

Between 1913 and 1915, William S. Whiting of Philadelphia acquired extensive timber rights in the Shulls Mills area of Watauga County and began construction of a large lumber mill at Shulls Mills. By 1916, the East Tennessee and Western North Carolina Railroad's Linville River Railway was extended to Shulls Mills, enabling Whiting's Boone Fork Lumber Company to ship lumber products to Elizabethton, Tennessee, for distribution to local and regional industry in the Appalachian and Mid-Atlantic region. During this time, Whiting constructed a logging railroad from the millsite at Shulls Mills upstream along Boone Fork Creek, initially ending after six miles at a major timber collection area near Old John's River Road and Yonahlossee Turnpike.

Primarily through the efforts of brothers B.B. and D.D. Dougherty, who saw rail transportation as crucial to opening the isolated region of northwest North Carolina, the ET & WNC's Linville River Railway tracks were extended to Boone and the Appalachian Training School in 1918. This extension provided Whiting the opportunity to acquire and develop additional timber stands in Watauga County in areas that had been previously inaccessible to major lumber production operations and distribution centers. Shortly after the railroad was extended to Boone, Whiting began construction of a second logging railroad to serve his mill, providing access to major timber holdings north of Boone in the Rich Mountain area. The terminus of this line was a location known as Flatwoods. Whiting's first logging railroad line on Boone Fork was extended to reach additional timber acquisitions at the head of the Boone Fork drainage during this time.



By 1920, Whiting's Boone Fork Lumber Company railroad system consisted of two major branches: 1) a line built from Shulls Mills along Boone Fork Creek that had doubled its initial length to reach the east slopes of Grandfather Mountain, and 2) a line extending from Boone around Howard Knob to the Howard Creek area along the north side of Rich Mountain, then to the Flatwoods area.

This paper will: (1) investigate the rationale for constructing logging railroads in the Watauga County area; (2) examine the topographic and related engineering concerns in design and construction of the rail lines; (3) determine the extent of the rail lines during the logging era and their evidence now; (4) trace the route through the related community structure of the time; and (5) produce a complete and accurate map of William S. Whiting's logging railroad system circa 1920-1925.

## Chapter 2: Physical Setting

The study area lies within a forty square mile area (25,000 acres) centered at 36 degrees 11 minutes north latitude and 81 degrees 43 minutes west longitude in Watauga County, North Carolina. Elevations within the study area range from just under 3,000 feet to over 5,500 feet. The area is located in the Appalachian Highlands ecoregion of the United States, in the Blue Ridge Mountain physiographic province, along the boundary of the Central Appalachian Ridges and Valleys province, of the Southern Appalachians (Omernik 1986).

Ecosystems of regional extent, or ecoregions, are differentiated according to a hierarchal scheme using climate and vegetation as defining characteristics. The study area shares important regional characteristics of an area extending from the southern Appalachians of North Carolina to the mid-Appalachian region of West Virginia (Fig 1). This regional designation places the study area in the Central Appalachian broadleaf, deciduous forest and meadow province of the hot continental regime mountains division of the humid temperate domain (Bailey 1995).

This broad categorization corresponds to the Cf climate type of Wladimir Koppen, modified to Dca by Glenn T. Trewartha. The climate is temperate, with distinct summer and winter, and all areas are subject to frost. Average annual temperatures range from below 50 degrees Fahrenheit in the north to about 64 degrees Fahrenheit at the south end of the highlands. Average annual precipitation varies from 35 inches in the



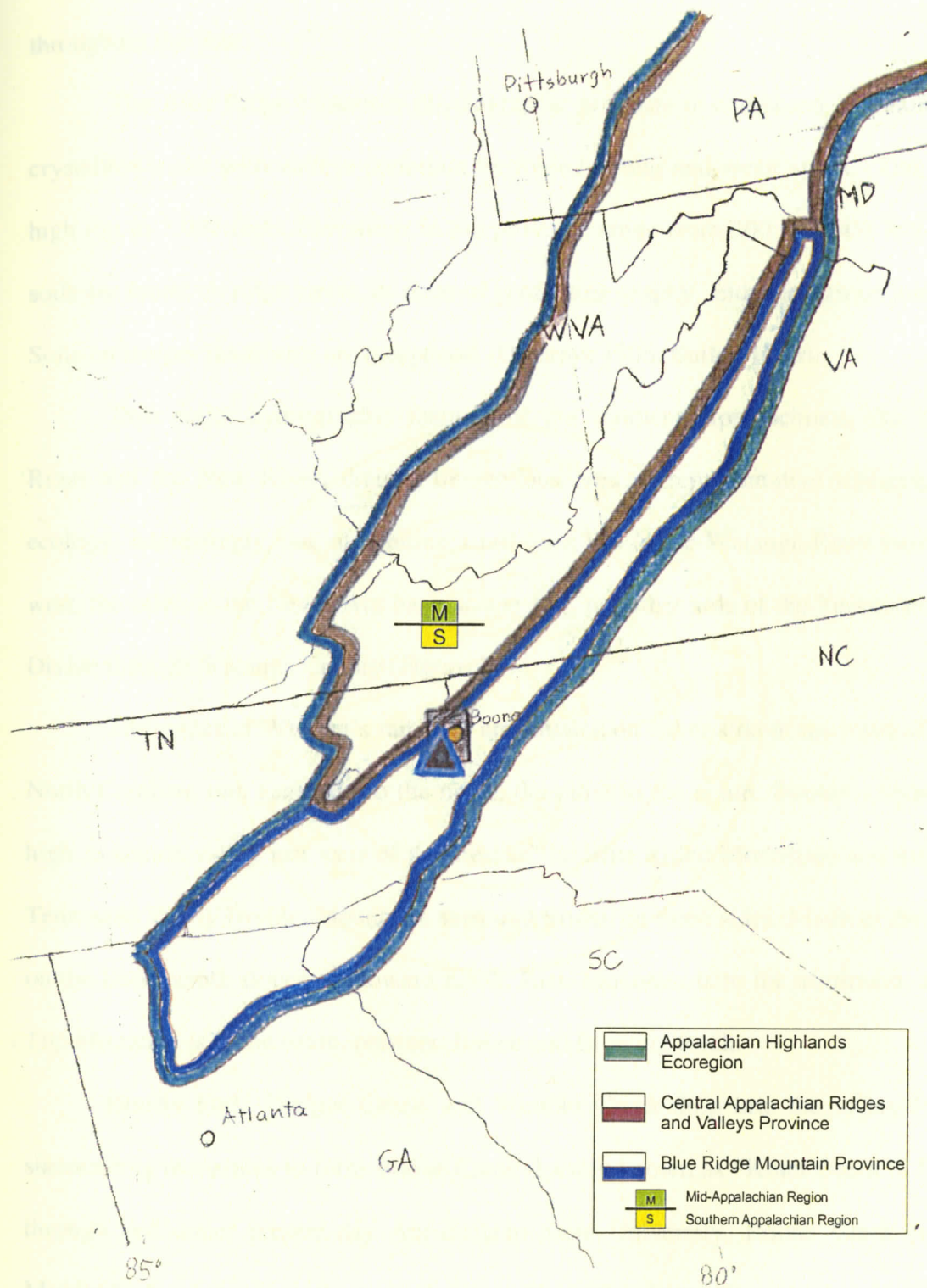


Figure 1: Study area and regional designations.

valleys to 80 inches on the highest peaks. Precipitation is fairly well distributed throughout the year.

The Blue Ridge Mountain physiographic province is composed of mountains of crystalline rocks with valleys underlain by folded strong and weak strata. The relief is high (up to 3,000 feet). Elevations in the province range from 300 to 6,000 feet. Ultisol soils are found on ridge crests, in areas of gentle topography, and in intermontane basins. Soils on steeper landforms are inceptisols (Omernik 1986, Bailey 1995).

Two major hydrographic features of the southern Appalachians, the Watauga River and the New River, drain a tremendous area of representative topography and ecology. Interestingly, one of Whiting's rail lines lies in the Watauga River basin to the west, the other in the New River basin to the east, on either side of the Tennessee Valley Divide through Watauga County (Figure 2).

The routes of Whiting's rail lines are situated on either side of the town of Boone, North Carolina, one generally to the north, the other to the south. Boone is located in a high mountain valley just west of the crest of the Blue Ridge Mountains and east of the Tennessee Valley Divide. Mountains surround Boone on three sides. Much of the town is on the lower south slopes of Howard Knob. Rich Mountain is to the northwest, and Flat Top Mountain is to the south, between Boone and Blowing Rock.

Brushy Fork, Hodges Creek, and Winkler Creek drop into the valley from the surrounding mountains to form Boone Creek (locally known as "Kraut Creek"). Flowing through and under present-day Appalachian State University, Boone Creek joins the Middle Fork of the New River at the State Farm floodway. From its headwaters near Blowing Rock, the New River flows north into Virginia, becomes the Kanawha River in



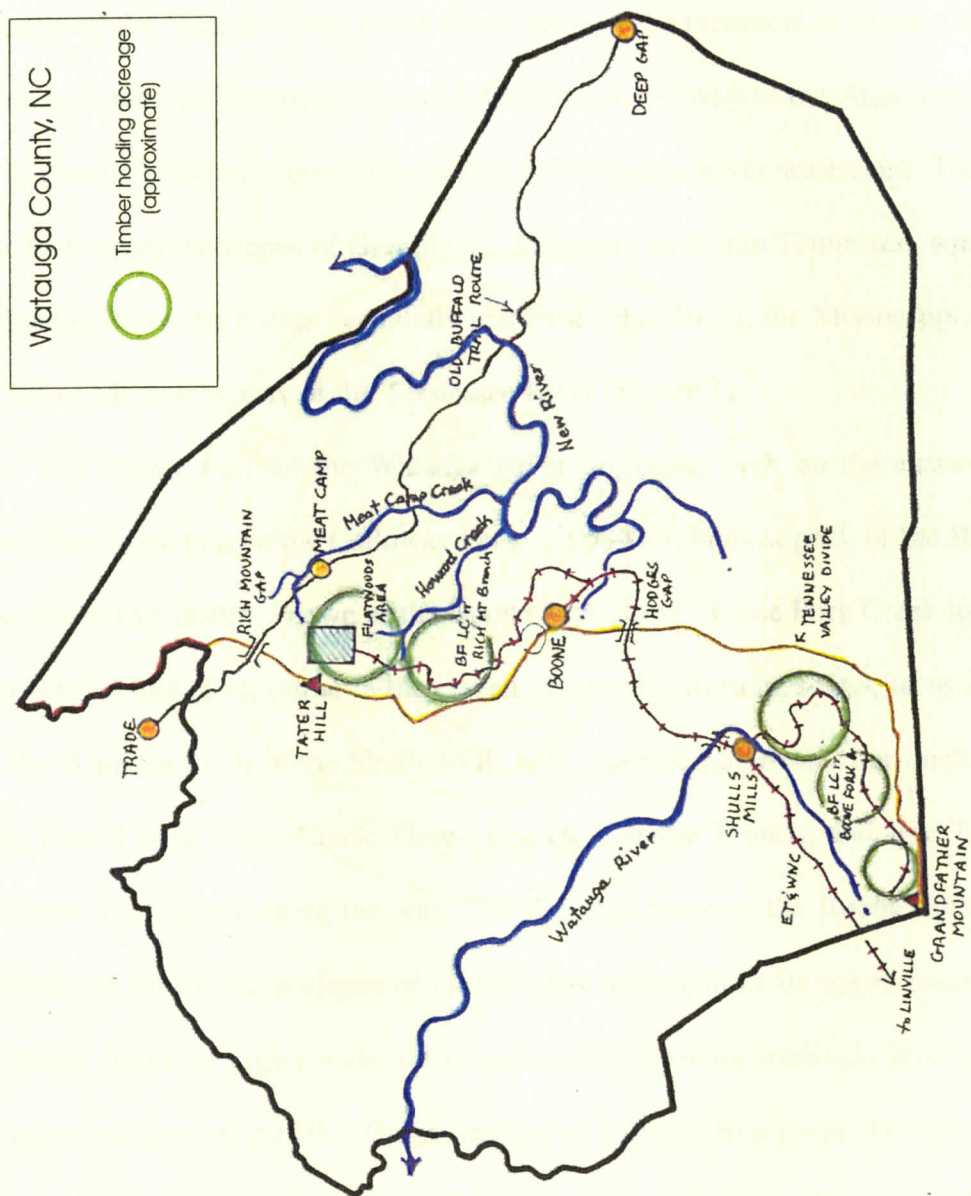


Figure 2: William Whiting's rail lines and timber holdings in Watauga County.

West Virginia, then joins the Ohio River to flow into the Mississippi River on its way to the Gulf of Mexico. The New River, along with the Watauga and the Yadkin, is one of three river systems that drain Watauga County.

The area of Watauga County east of the crest of the Blue Ridge is drained by tributaries of the Yadkin River, which flows through the Piedmont of North Carolina and continues as the Pee Dee River in South Carolina on its way to the Atlantic Ocean. The largest area of Watauga County lies within the Watauga River watershed. The Watauga River flows from the slopes of Grandfather Mountain west into Tennessee, where it joins the Holston River. Its waters eventually reach the Ohio River, the Mississippi River, and the Gulf of Mexico by way of the Tennessee River (Figure 3).

The Boone Fork of the Watauga River originates high on the eastern flank of Grandfather Mountain below Calloway Peak (5,964 feet, highest peak of the Blue Ridge) in the cirque-like feature known as the Boone Fork Bowl. Boone Fork Creek loses almost 2,000 vertical feet of elevation in the eleven or so miles from its source to its confluence with the Watauga River in the Shulls Mills area. Several major branches, including Cold Prong, Laurel Fork, Sims Creek, Green Branch, Cannon Branch, and Bee Tree Creek, join Boone Fork Creek along the way. The drainage basin of the Boone Fork system is characterized by the steep slopes of Grandfather Mountain in its upper reaches. Boone Fork Creek flows through a wide, open section of consistent, relatively level topography just below the crest of the Blue Ridge, leading to a drop into a gorge through the Pigpen Knob-Myria Knob area, before reaching the Watauga River floodplain four miles southwest of Boone.

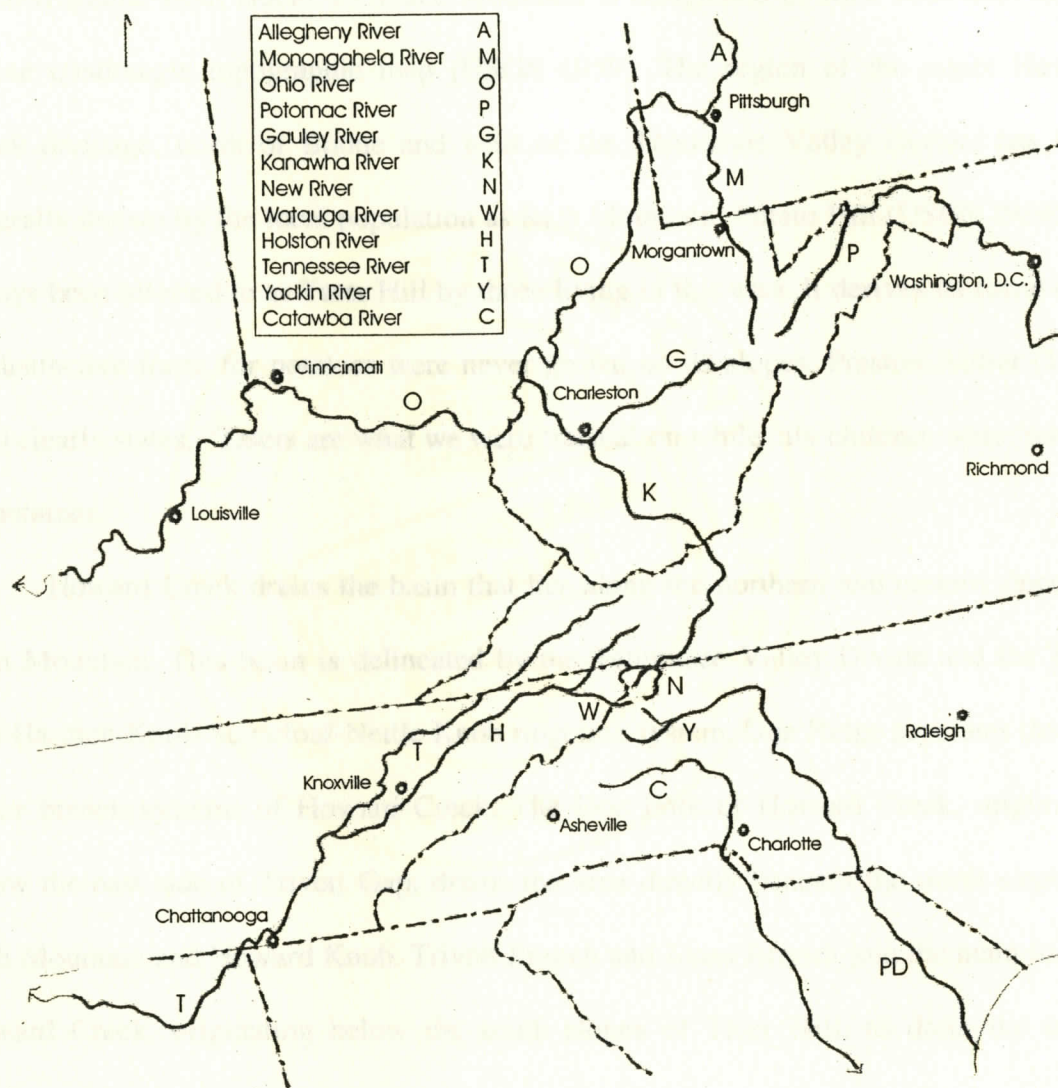


Figure 3: Regional river systems



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Rich Mountain bounds the town of Boone to the northwest. Its ridgeline, at an average elevation of 4,500 feet, marks the Tennessee Valley Divide. Both Tater Hill and Rich Mountain Bald lie along the Tennessee Valley Divide as it forms the western boundary of the Flatwoods on upper Howard Creek and upper Meat Camp Creek. This entire ridgeline from Boone to Snake Mountain is designated as Rich Mountain on the Boone quadrangle topographic map (USGS 1959). The region of the upper Howard Creek drainage, north of Boone and west of the Tennessee Valley Divide, has been generally known by the local population as Rich Mountain. Potato Hill (USGS 1959) has always been referred to as Tater Hill by those living in this area. It derives its name from its distinctive form, for potatoes were never grown on its slopes. Preston Arthur (1915, 233) clearly states, "Taters are what we were 'raised' on while city children were 'reared' on potatoes."

Howard Creek drains the basin that lies along the northern and eastern slopes of Rich Mountain. This basin is delineated by the Tennessee Valley Divide and the Tater Hill-Harmon Knob-Sugarloaf-Nettle Knob ridgeline system. Doe Ridge separates the two major branch systems of Howard Creek. The Doe Fork of Howard Creek, originating below the east side of Trivett Gap, drains the area directly beneath the north slopes of Rich Mountain and Howard Knob. Trivett Branch and Jones Branch join the main fork of Howard Creek, originating below the south slopes of Tater Hill, to drain the upper reaches of the basin. Howard Creek drops nearly 1,300 vertical feet as it flows ten miles to its confluence with the South Fork of the New River approximately three miles northeast of Boone.

The significance of the physical setting to the development of the rail lines in Watauga County was major. The climate and elevation contributed to the types of forest. The topography and hydrography determined accessibility to the timber therein.

### **Southern Appalachian Forests**

The forests of the southern Appalachians are a mixture of hardwoods and softwoods. The higher mountain environments support spruce, fir, and hemlock. The lower mountain slopes are covered with oak, beech, and maple. Chestnut trees once thrived on the middle slopes, but they were destroyed by the chestnut blight (Swanson 1994). The general forest type at the onset of the logging era of the region was hardwood-conifer forest dominated by yellow poplar, chestnut, maple, oak, ash, white pine, hemlock, and balsam (Lord 1963). The balsams ("he balsam" [red spruce] and "she balsam" [fraser fir]) and hemlocks were cut from the upper elevations above 4,000 feet. Deciduous hardwood species and white pine made up the timber stands of the lower elevations (Clark 1954).

The original forests of the mid- and southern Appalachians were magnificent. Those early forests were the result of centuries of evolution and adaptation, and thus produced the biggest and the best of virtually every indigenous tree species (Davis 1996). Fifteen million acres of dense virgin timber blanketed the mountainous terrain that was to become the state of West Virginia. This mid-Appalachian upland forest area was covered with oak, poplar, ash, cherry, walnut, chestnut, spruce, and hemlock in vast quantities (Stephenson 1993). The general southern Appalachian forest type in what is now North



Carolina was hardwood-conifer, dominated by yellow poplar, chestnut, maple, oak, ash, white pine, hemlock, spruce, and fir.

Primary forests (often referred to as "old-growth" forests) are those that never have been clearcut and that have little or no evidence of past human activity. Such forests might have been grazed, they might have experienced limited exploitation of valuable tree species, and their floors might have been burned by Native Americans and European pioneers. The term "virgin forest" may be employed in common usage to refer to primary forests, but implies that those tree communities have been untouched or unaffected by civilization in any way. Secondary forests are those that have developed after the previous forest was extensively logged or clearcut. The term mature forest refers to a secondary forest that has existed longer than the normal harvesting rotation practiced by foresters on that particular forest type (Brown 1947).

There are only a few remnants of primary forest left in the southern Appalachians. Native American settlement appears to have been concentrated on the floodplains and had little permanent effect on forests in these locations. Settlement of the southern Appalachian region by European-Americans began in the eighteenth century and increased the extent and permanence of forest clearing. Timber harvesting for industrial purposes logged much of the forests of the southern Appalachians between 1880 and 1920. Catastrophic fires frequently followed logging. Denuded slopes increased runoff to magnify flood effects of significant rainfall events, especially in 1916 and 1940. However, the southern Appalachians still contain one of the largest concentrations of primary forest east of the Mississippi River (Davis 1996). An on-the-ground citizens survey of Pisgah National Forest in western North Carolina in 1997 documented 38,900

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acres of old-growth forest. This is the largest known acreage of primary forest in the southern Appalachians outside of Great Smoky Mountains National Park. The oldest trees documented through core samples were a 331 year old Eastern hemlock and a 330 year old tulip popular (*The Charlotte Observer* 1997).

Vertical zonation of vegetation prevails across the region. Tree species are stratified according to elevation (Figure 4). The valleys of the southern Appalachians support a mixed oak-pine forest. Above this zone lies the Appalachian oak forest, dominated by a dozen species in each of the white oak and black oak groups. Chestnut was once abundant, but a blight eliminated it as a canopy tree. Mixed mesophytic forest extends into narrow valleys (coves) of the southern Appalachians, where oak vegetation prevails. Above this zone lies the northeastern hardwood forest, composed of birch, beech, maple, elm, northern red oak, and basswood, with a mixture of hemlock and white pine. Spruce-fir forest and meadows (grassy balds and heath balds) are found at the highest elevations (Swanson 1994).

Just below the summit areas of Grandfather Mountain lies the upland forest. At the highest elevations of this forest community, red spruce and Fraser fir grow from ridgeline level (5,800 to 5,900 feet) to approximately 1,000 feet below the ridgeline. The North Carolina Blue Ridge represents the southernmost extent of the range for this Canadian boreal forest (Stephenson 1993). The southern Spruce-Fir ecosystem, like other Canadian relict communities, has evolved on Grandfather Mountain and other regional peaks into a woodland distinct from its forerunner. A number of deciduous and evergreen secondary tree species thrive under the umbrella of the two dominant conifers (spruce



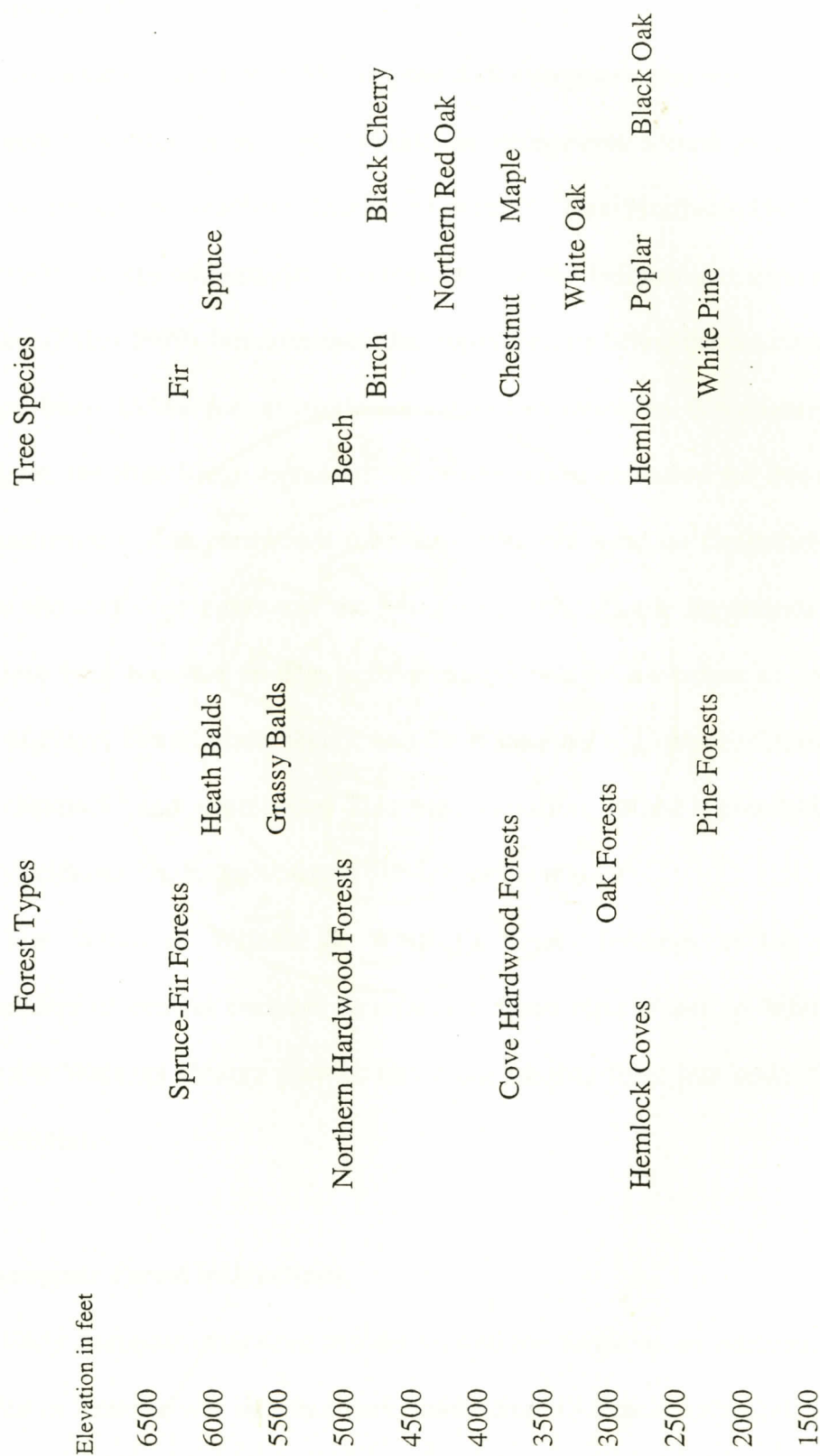


Figure 4: Distribution of forest types and tree species by elevation in the southern Appalachians.

(Adapted from R.H. Whittaker, 1956. "Vegetation of the Great Smoky Mountains" Ecological Monographs 26(1): 58.

and fir), including yellow birch, Canadian hemlock, serviceberry, mountain ash, and mountain maple.

At elevations close to 5,000 feet, the dark evergreens thin and one of the clearest community transitions of the high Appalachian ecosystems occurs: from the Spruce-Fir forest to the classic Northern Hardwood forest. This Northern Hardwood system occasionally adjoins and mingles in transition with the balsams and spruce up to about 6,000 feet (Tager 1999), but dominates the slopes directly below the coniferous spruce-fir elevation limits (5,964 feet at maximum summit elevation on Grandfather Mountain). Here again, the Blue Ridge represents the southernmost extension for this non-endemic forest community. The hardwoods form an elevational band on Grandfather Mountain between the mid-slope coves and the evergreens, although the hardwoods often subtly merge into both ecosystems. The healthy canopy will be a mixture of yellow birch, yellow buckeye, beech, black cherry, and the occasional red spruce, Carolina hemlock, eastern hemlock, and white pine. This high elevation, mixed mesophytic (moisture-loving) deciduous forest can be found throughout the region.

The forests of William S. Whiting's timber holdings in the region were representative of general southern Appalachian forest type. Trees on Whiting's timber holdings in Watauga County grew at elevations ranging from just under 3,000 feet to over 5,500 feet.

### **Anthropogenic Forest Interactions**

Early European-American settlers viewed the forest as an impenetrable barrier. The forest in America was seen as a dark, foreboding wilderness, enhanced by the lore of

their European forest myths, yet unlike anything known to them in Europe. It seems that no special reverence was held for the continent's vast virgin woodlands. The "Great Forest," as it has since been called, seems to have induced fear and frustration in the majority of early white settlers (Stephenson 1993).

Despite the abundance of game, the forest was a monumental inconvenience for those wanting to farm and establish villages and towns. Wilderness stood in the way of what the settlers saw as their manifest destiny to populate and subdue the land for proper Christian occupation (Davis 1996). Throughout the 1600s and 1700s, literally millions of forested acres were cut and burned in one of the world's great blitzes of wastefulness.

The earliest settlers in Watauga County utilized timber for immediate shelter and construction needs. Indeed, their greatest task was to clear the forest to prepare land for homesites and cultivation. According to some accounts, they cut down the great trees, sawed the trees into suitable lengths, rolled the logs into heaps, and burned the wood (Whitener 1949).

As settlement growth boomed and wood became well established as a primary building material, subsequent generations of European-Americans sensed a bonanza in merchantable timber on the still substantial virgin acreages. By the middle of the 1800s, the infamous timber barons had commenced their assault on what remained of the presettlement forests. New England's woods and those along the Eastern seaboard fell first. Then came the forests of New York state, those of the Great Lakes region, and the woods of Pennsylvania's Allegheny plateau. With the depletion of those reserves, attention turned towards the forests of the South, before finally shifting west.



The valleys, hills, and mountains of western North Carolina contained huge unspoiled virgin stands of timber before the 1880s. One early observer was so impressed by the expanse of the forests that he labeled the Great Smoky Mountains area as, "A wilderness of the deepest green" (Arthur 1914, 47). In some of the mountain coves, huge tulip poplars grew up to 110 feet tall. As a timber product, such a tree would yield finished boards almost five feet wide (Parker 1991). In climax forest communities, hemlock and chestnut trees towered almost two hundred feet above the forest floor. An inkling of how massive the trees were that once covered the southern Appalachians can be gleaned in rare locations, such as the Joyce Kilmer Forest, near the Great Smoky Mountains in North Carolina.

Natural resources targeted for exploitation in the latter part of the nineteenth century included the vast timber resources of the region. By the 1920s, however, most of the original Eastern forest, and sometimes two generations of replacements, had been cut (Davis 1996). Numerous varieties of trees occurring at various elevations were utilized in the production of lumber from timber and in the distribution process. Dressed lumber, from oak and the coniferous species, was shipped from the mill for use in construction. Pulp wood was processed into paper. Certain woods and barks, especially from chestnut trees, were utilized for tanning leather and fabric. Historically, red spruce was the dominant coniferous species in the mid and southern Appalachians. The species has been continuously sought for timber, pulp, and construction (from aircraft frames to piano sounding boards) for over 150 years.

Once prominent throughout the eastern half of the country, black cherry suffered from being one of the most prized cabinet woods in North America. Along with sugar

maple and black walnut, black cherry was cut extensively for its prized wood, even before the all-out logging of the nineteenth century. The remaining black cherry trees on the slopes of Grandfather Mountain are mature or second succession growth (the virgin trees are gone). Most of these forests were not cut a second and third time. Tager (1999) suggests the difficult terrain as a reason for the lack of later cutting. Today's black cherry populations on Grandfather Mountain remain as some of the finest examples left in the southern Appalachians outside of Great Smoky Mountain National Park.

### Chapter 3: Logging Era in the Region

The economic potential of the incredible forest resources of the mid- and southern Appalachian mountains was attractive to lumbermen, but the forests were inaccessible for many years because of rough terrain that made transportation difficult. The history of logging in the southern Appalachian region can generally be divided into two distinct periods. The first, extending from approximately 1880 until 1900, is referred to as either the selective or peripheral cutting period (Parker 1991). For this type of logging, only selected species were desired and the loggers operated only in areas of easy access, most often along primary watercourses.

The first species sought by loggers were black walnut, ash, and cherry; later, poplar and oak were harvested. During the nineteenth century, sawmilling was done mostly to meet local needs. Small water-powered mills were combined with gristmills; these mills sawed planks slowly with a reciprocating saw. By 1900, it was generally inefficient and economically unfeasible for selective cutting to supply large mills with the amount of timber needed to keep the mills operating (Clarkson 1964). Appalachian sawmills now included portable mills, semi-portable mills, and big bandsaw mills. Only the latter were really large enough to be served by logging railroads. The others were built close to the timber source and were served by skidding; that is, dragging logs with draft animals or by mechanical means.



Railroads began to open up the mountain valleys by 1890, and lumber operators from the North, especially from Pennsylvania, began to acquire large tracts of forest land. By 1900, the logging industry shifted its emphasis from selective cutting to large-scale cutting to meet increasing demand for timber products (Parker 1991). Regional growth required large quantities of lumber to construct homes, industrial buildings, and business establishments. Railroad crossties and bridge timbers were needed in ever-increasing quantities as main and spur lines were developed throughout the region. Natural resource extractive industries underwent a period of tremendous growth. The requirement for mine timbers increased rapidly as the number of coal and iron mines proliferated to serve growing needs. The completion of the Champion Fiber Company plant in Canton, North Carolina, furnished a market for wood by-products which normally would not have provided profit for sawmills (Poole 1995).

Lumber became an increasingly important commodity on the open market. Demand from large cities and foreign countries outstripped local supplies and by the end of the nineteenth century the small local sawmills were supplanted by large operations such as those of William M. Ritter and William S. Whiting. These operations would employ several hundred men and set up their own boom-town/company-town communities. In 1908, it was estimated that 300 portable mills cut 78% of the timber in western North Carolina, while seven large band mills together cut only 16% of the timber (Graybeal 1998). This was the beginning of the era of the big mills. The big mills' percentage of the total grew rapidly to more than 80% through World War I, only to shrink once the big timber stands were exhausted.

Lumbering in the mountains began in earnest after 1900, and peaked during World War I. This was the era of the large band mills and the logging railroads. With the coming of steel rails to western North Carolina, logging expanded on a grand scale. By 1914, over 200 miles of logging rail lines operated in the western part of the state between Watauga County and Graham County (Poole 1995).

Most mills, including those of William S. Whiting in various locations in the southern Appalachian region, required a self-owned logging railroad to transport logs from forest to mill. The companies either purchased large tracts of timber land outright or obtained timber harvesting rights from local property owners, and in these ways established stands comprising thousands of acres. Construction of temporary logging spurs, logging and logging camp operations, the harvesting of tanbark, transport of timber products to the sawmill, and the handling of sawn lumber from the sawmill were the elements of the timber business that relied on the lumber company's railroad operations.

### **Logging Practices**

Logging of the era involved cutting and trimming the timber, moving the logs to the railroad, carrying them to the sawmill, sawing the lumber, drying or further finishing the lumber, and shipping lumber to market. Logging was a labor-intensive, hands-on process, although quite efficient. Clearcutting was the norm by the early 1900s. Two-person crosscut saws were used to cut entire slopes of standing timber. Logs were hauled (skidded) to landings and collection points by mules and horses via skid roads.

Skid roads were located and blazed by a worker called the buck swamper. When a slope was to be cut, the buck swamper started from the landing and ran a rough road into



the timber. A crew of swampers then followed, cutting all the trees and shrubs at ground level, leaving no stumps standing (Clarkson 1990). Roads were located so skidding was done downhill as much as possible and on gentle slopes. A great deal of care and time was invested in construction in order to facilitate the skidding and to reduce hazards for the horse teams.

One of the first methods employed to move logs to the mill was splashdamming. This practice entailed rolling (or "ballhooting") logs down cleared paths into large streams. Meanwhile, the creek had been dammed upstream of the collection point in order to back up the water and raise the water level significantly. After a sufficient number of logs had been gathered in the stream below, the water would be released either by a rudimentary control gate or the dynamiting of the entire temporary dam. The rush of water would carry the logs downstream to the mill itself or to another dam, where the process would then be repeated (Bryant 1923). The practice was inefficient and destructive due to the number of logs which would be lost in the rush downstream and due to the immediate effects on the watercourse topography and environs. When loggers depended on splash dams for moving logs, a certain percentage of logs was expected to be lost (Warden 1997).

Another early means of removing logs was the pole or tram road. The tram road resembled a railroad in a general sense, with one major exception: the rails were made of logs between nine and twelve inches in diameter, lap-jointed pole to pole, and held in place by wooden stakes driven into the ground. Wheeled cars or carts rolled over these wooden rail systems. The method of propulsion was draft animals (mules, horses, oxen), except on some downgrades where only gravity was employed. Most tram roads did not



exceed more than a couple of miles in length. In order to achieve stability, most tram roads had a fairly wide gauge, generally of five to six feet in width. Tram roads seldom exceeded grades of 1.5% to 2%, because draft animals were utilized (Clarkson 1964). Due to irregularities in joining the logs serving as rails (and in the logs themselves), the flanges on the log cars were oversized (Warden 1997).

While the logging industry shifted its emphasis from selective cutting to large scale clearcutting, the industry also underwent an evolution in the methods of log removal. In 1876, a Michigan logger, Scott Garrish, demonstrated that steel rails could be employed to remove timber and deliver it to the local mill (Poole 1995). Soon, loggers across the nation, including those in western North Carolina, began using steel rail lines for timber removal. Several advantages facilitated the adoption of the new technology. By allowing the use of railroad machinery (locomotives and log cars), areas previously inaccessible due to grade considerations and general remoteness were opened up. Unlike splashdamming, railroads lost no logs in the transportation to the mill. The relative efficiency of logging railroad lines compared to the tram road system was obvious to the loggers. Loggers could now extract most tree species, softwoods and hardwoods alike, due to increased overall accessibility. This increased the stand-per-acre count and contributed to the overall profitability of the operation (Brown 1947).

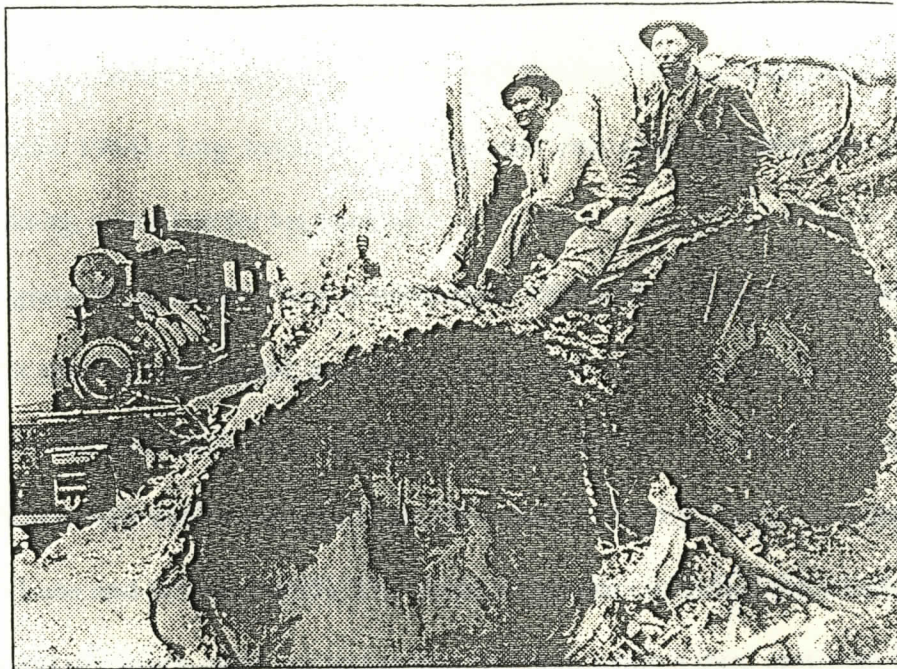
Cutting was done by the woods crews, who felled the trees and cut them into shorter lengths. If cutting was near the sawmill, the woods crews might live in the company sawmill town and ride the log train to work. This was the case with the Boone Fork Lumber Company at Shulls Mills. In some regional locales, as cutting moved further into the mountains, temporary camps were established with bunkhouses,

cookhouses, and commissaries. The terminus of the Boone Fork Lumber company railroad at Flatwoods exemplified this phenomenon to some extent. Some workers on Whiting's Rich Mountain holdings had been residing or boarded in the Meat Camp area and commuted locally as opposed to traveling from the millsite itself (Figure 5).

Southern Appalachian loggers lived in either company towns, at home, or in work camps built alongside the logging spurs in the forests. The loggers worked ten-hour days, six days a week in the woods. A cutting crew consisted of five wood hicks. The term "wood hick" generally applied to any man harvesting timber in the woods, and was not a derogatory term (Lane and Schnepf 1999). A five-man crew consisted of a fitter, who cut the notch in the tree to determine its direction of fall, two sawyers who sawed down the tree with long crosscut saws, and two swampers, or knot bumpers, who cut the limbs off the felled tree. The swampers also cut brush in the planned direction the tree was to be felled (Clarkson 1990). After the tree was on the ground and delimbed, the sawyers bucked (cut) the tree into logs of the appropriate length.

After the felled trees were bucked into logs, the logs were hauled to piles adjacent to the railroad spurs by one of several methods. Logs were skidded by two-horse teams worked by teamsters. The logs were frequently chamfered on the end to facilitate skidding and a team of horses could pull two logs chained together (Bryant 1923). Skidding was most frequently downhill to maximize the help of gravity and because the railroads followed the stream valleys as far as they could. Temporary barns were provided to shelter the horses in the woods camps, and grain and hay were supplied by train (Lane and Schnepf 1999). Some horse teams were owned by the lumber company, while others were on contract to haul logs.





This undated photo shows large chestnut trees being logged in a N.C. forest near the turn of the century.

Name of each person whose place of abode on April 15, 1910 was in this family		Relationship to Head of House	Color/Race	Sex	Age	Marital Status	Years Married	Number of Children	Number of Living Children	Individual's Birthplace	Father's Birthplace	Mother's Birthplace	Union/Confederate Survivor	Occupation
Davis,	Payton	Head	W	M	40	M <sup>1</sup>	27			NC	NC	NC		Logger
	Laura	Daughter	W	F	23	S				NC	NC	NC		Cook and Housekeeper
	Daniel	Son	W	M	19	S				NC	NC	NC		Logger
	Walter	Son	W	M	18	S				NC	NC	NC		Logger
	Brazilian	Cousin	W	M	38	M <sup>1</sup>	17			NC	NC	NC		Logger
	Walter	Cousin	W	M	19	S				NC	NC	NC		Logger
Moretz,	Eugene	Head	W	M	29	M <sup>1</sup>	10			NC	NC	NC		Farmer
	Dora	Wife	W	F	37	M <sup>1</sup>	10	7	7	NC	NC	NC		None
	Flora	Daughter	W	F	9	S				NC	NC	NC		None
	Carl R.	Son	W	M	8	S				NC	NC	NC		None
	Manley E.	Son	W	M	6	S				NC	NC	NC		None
	George C.	Son	W	M	4	S				NC	NC	NC		None
	Earnest L.	Son	W	M	2	S				NC	NC	NC		None
	Zella	Daughter	W	F	14/12	S				NC	NC	NC		None
	John	Father	W	M	79	Wd				NC	NC	NC	CA	None
Adams,	William	Head	W	M	21	M <sup>1</sup>	1			NC	NC	NC		Proprietor
	Mollie	Wife	W	F	25	M <sup>2</sup>	1	3	3	NC	NC	NC		None
	Herman	Son	W	M	3	S				NC	NC	NC		None
	Hubert	Son	W	M	11/12	S				NC	NC	NC		None
Love,	William G.	Board	W	M	36	M <sup>1</sup>	15			TN	TN	TN		Sawyer
Barlow,	Joseph	Board	W	M	39					NC	NC	NC		Inspector
Cornett,	William	Board	W	M	44	M <sup>1</sup>	19			NC	VA	VA		Engineer/Lumber Mill
Davis,	Willard	Board	W	M	22	M <sup>1</sup>	2			NC	NC	NC		Ratchet Setter, Lumber
Church,	Abner N.	Board	W	M	35	M <sup>1</sup>	2			NC	NC	NC		Off Bearer, Lumber Mill
Brown,	Clinton	Board	W	M	18	S				NC	NC	NC		Log Barker, Lumber Mill
Love,	Peter	Board	W	M	13	S				TN	TN	TN		Lumber Packer

Figure 5: Circa 1900 photo; Meat Camp township households, 1910.

(Adapted from *The Charlotte Observer*; Watauga County census records).



If the timber was being cut near the railroad (within 500 feet or so) skidding might be done directly using a cable from a rail mounted log loader. From further than 500 feet away, horse teams might be used to pull the logs within reach of the loader's cable (Clarkson 1964). Log loaders were versatile and could be used for this short distance skidding, as well as for log loading.

The groundhog skidder was a homemade contraption built on a skid. It was powered by a small steam engine, and had a winch and a fixed boom. The skidder was hauled on a log car and was usually operated while on the car, with the car being blocked up and anchored with cables running from the boom to nearby stumps to keep it from overturning (Lane and Schnepf 1999). The skidder operator controlled the winch, another crewman pulled the winch cable out to the logs by hand, while a third crewman tended to the steam-fired boiler. The skidder was used to pull logs up to 1,500 feet to the loading site, frequently across creeks, but was not capable of lifting and loading logs.

A few of the largest logging operations used tower skidders such as the Lidgerwood skidder, with a tall steel mast from which wire cables could reach out for up to a mile across the valleys (Warden 1997). Rigged vertically to access upslope areas, these systems became aerial tramways. Tower skidders and aerial tramways were much less common in Appalachian logging than is western logging (Bryant 1923), although an extensive aerial tramway system was utilized on the west slopes of the Black Mountain range in 1915 (Lovelace 1994). A modified steel mast skidder was in place at the Flatwoods log collection area at the terminus of the Boone Fork Lumber Company's Rich Mountain logging railroad.

Logs were loaded onto the railroad cars by steam-powered loaders utilizing a swiveling crane and a steel or wood boom. Several types were used. The predominant log loaders in the mountains of North Carolina were the Barnhardt and the American (Parker 1991). Boone Fork Lumber Company had at least one log loader in its inventory; company records indicate that an American Model D was purchased in 1917 (*Whiting Lumber Company Records*). The Model D had four wheels in a timber frame that supported the crane and boom and was self-propelled.

Log loading on single narrow-gauge logging track was unique. Without several tracks on which to switch individual rail cars for loading, the log loader simply lifted all of the cars off the track. The loader then proceeded on the track along the line of cars, lifting one at a time onto the track, loading it from the adjacent pile of logs, then repeating the process with the next car (Poole 1995). With this method, an entire train could be loaded on a single track. Certain locations along the logging rail line served as convenient collection and loading points due to sufficient width of roadbed and to the proximity and ease of access to cut timber.

In addition to sawlogs, the woods crew might cut pulpwood from the small, less marketable tree species, frequently from the softwoods. Cut in four-foot lengths, the pulpwood might be sent down to the railroads in flumes (Parker 1991). Flumes were V-shaped wooden troughs extending from collection points uphill and were fed by water from small streams or springs. Flumes carried the smaller logs and occasionally larger sawlogs, depending on the availability of other means of transport. Flumes were utilized at several points on Whiting's logging railroad branch up Boone Fork Creek and into the Boone Fork Bowl on Grandfather Mountain.



The woods crew also might cut extract wood and bark for the tanning industry. Tanbark was the bark of trees rich in tannin and was processed in great quantities to provide the chemical used to convert animal hides into usable leather in tanneries. Tanning was one of the oldest industries in the United States; the tanning business was found wherever there was logging. The chemical extract from chestnut bark and hemlock bark was especially useful for the tanning of leather. Both species were plentiful on Whiting timber lands and would be hauled from the woods stacked up in gondola cars.

The Boone Fork Lumber Company cut poplar, ash, oak, and chestnut for lumber, shipped pulpwood to the Champion Paper Mill in Canton, North Carolina, and shipped extract wood to tanneries in Elizabethton and Johnson City, Tennessee. All of these products went out of Shulls Mills over the Linville River Railway.

### **Sawmills and Milling Practices**

The cutting of timber and the milling of lumber became a viable local industry throughout Watauga County in the nineteenth century (Whitener 1949). Typically, at first, logs were cut by hand, then hauled to the mill site by teams of horses. The mills were usually powered by wood-fired steam boilers. The logs were moved along at the mill site by hand; after the logs were sawed, the lumber was loaded onto wagons and hauled to regional markets such as Roan Mountain, Tennessee, or Wilkesboro, North Carolina (Shepard 1984).

Some sawmillers moved their mills to the timber. The mills were moved from place to place as the operator bought timber and sawed it into lumber. The mills were driven by a steam boiler. A steam boiler was extremely heavy, and it took four or five



teams of horses to move the entire outfit (Church 1984). Workers would accompany the mill operator and were employed either logging (cutting) timber or sawing (milling) lumber.

Portable mills usually had a circular headsaw and a simple carriage. The mill was driven by a portable steam boiler with an engine on top. This rested on spoked iron wheels, which could be pulled like a wagon. The headsaw and carriage were built on a timber foundation and protected by a simple open-sided shed (Altmayer 1994). Mills of this type were located close to the timber supply and moved as the timber was exhausted. Lumber was shipped by wagon to the nearest road or rail loading point. The daily output of these mills ranged from about 5,000 to 10,000 board-feet of lumber.

A slightly larger, semi-portable mill was very similar to the portable mill, but had additional machinery (such as an edger and cutoff saw) to boost cutting volume. These mills had a capacity of 12,000 to 15,000 board-feet per day (Keith 1989). The semi-portable mill was driven by a stationary engine and a separate boiler mounted on more substantial concrete or brick foundations than the smaller portable mills. Saws were powered by a boiler which burned sawdust and scraps from the mills.

Band mills had up to three band headsaws and much secondary equipment for support and delivery. The bandsaw, with six- to ten-foot diameter wheels, cut faster than a circular saw and cut a narrower kerf through the log, wasting less lumber. It required a very solid foundation and an elevated cutting floor. Logs were dumped from the log train into a storage pond and elevated to the log deck on a chain. The log carriage would then take the log through the saw (Brown 1947). Several saws were used, with one always

being filed or sharpened while another was in use. A separate filing room was utilized for this purpose.

Band mills were very large, with separate boiler houses, lumber drying yards, dry kilns, and planing mills (where cut logs were further processed into dimensional lumber). Such a mill might cut from 30,000 to more than 80,000 board-feet of lumber in a single ten-hour day. A Whiting company mill at Abingdon, Virginia, built in 1905, was a single band mill with a capacity of 40,000 board-feet (Parker 1992). The Ritter mill at Saginaw, (now Pineola) North Carolina was similar to the Abingdon mill and had a capacity of 50,000 board-feet per day. The Boone Fork mill at Shulls Mills, built in 1916, was cutting 50,000 board-feet in 1917 and reached peak production of 80,000 board-feet per day several years later (Hayes 1992). The Boone Fork Lumber Company band mill equipment was electrically driven, with power generated by water power and by a steam boiler. Large sawmills, such as the Boone Fork Lumber Company mill at Shulls Mills, were built to serve large tracts of timber and were expected to operate for many years.



## Chapter 4: Transportation

### Early Roads

The northwest North Carolina and northeast Tennessee region had been generally isolated since colonial settlement times due to topography. When the first contingent of Moravians trekked to North Carolina from Pennsylvania in 1753, they came down the Great Road through the Shenandoah Valley in Virginia. As they approached North Carolina, the travel became more difficult. Frequently the travelers were forced to cut down trees and use grubbing hoes to clear a passage for their wagons (Jolley 1969). Throughout the nineteenth century, transportation was the most critical problem facing the people of Boone and Watauga County.

The area was so inaccessible that Watauga, Ashe, and Allegheny counties were known as the Lost Provinces (Arthur 1914). They were part of North Carolina, but their economic links were with Tennessee, because slightly better roads existed to the west. Until the twentieth century, North Carolina's roads were built and maintained by the counties, rather than by the state (Lefler and Newsome 1934). Some counties levied special road taxes, employed convict labor, and used improved methods of road building; however, the more isolated and rural areas received little attention (Robinson 1955). Few of the mountain roads were graded or otherwise improved. Inhabitants, therefore, found transportation generally slow, difficult, and expensive.



Most early roads in the northwest North Carolina and northeast Tennessee area were little more than cart paths that followed old Indian trails and buffalo traces from gap to gap. One such road was the Wilkesboro to Trade Road ("Buffalo Trail"), the main wagon road along Meat Camp Creek that crossed Watauga County from Deep Gap, through Rich Mountain, to Trade, Tennessee, since colonial days (Figure 6). This early wagon road followed the route of the Buffalo Trail, a migratory path for bison from the great plains of Ohio to the Atlantic Coast (Jakle 1969).

By 1780, one of the only roads across the Blue Ridge Mountains was the Yellow Mountain Road. It was part of a North Carolina intra-state horse and horse-drawn transportation system running through Wilmington, Fayetteville, Salem, Wilkesboro, Morganton, and McKinney Gap, over the Unaka Mountains, into Sycamore Shoals, a frontier outpost<sup>1</sup> on the Watauga River. It is believed that this trace was blazed by the frontiersman James Robertson, using information provided by Daniel Boone (Robinson 1955). Prior to 1780, Boone had established the Boone Wilderness Trail in traveling from his home on the Yadkin River to the western frontier at Cumberland Gap. The idea of a trade route across the southern Appalachians dates to the eighteenth century. A turnpike from Knoxville, Tennessee to Spartanburg, South Carolina, was finally built in the early 1800s (*Archives of Appalachia* 1997).

The 1818 census reported a population of 3,694 people in Ashe County, which then included Watauga, much of Avery, and Alleghany (Arthur 1914). Dr. Elisha Mitchell, who later made the first ascent of the highest peak in the eastern United States that now bears his name, described the region as "An ocean of mountains" during a geological survey of Ashe County, North Carolina, in 1828 (Robinson 1955, 113). Roads

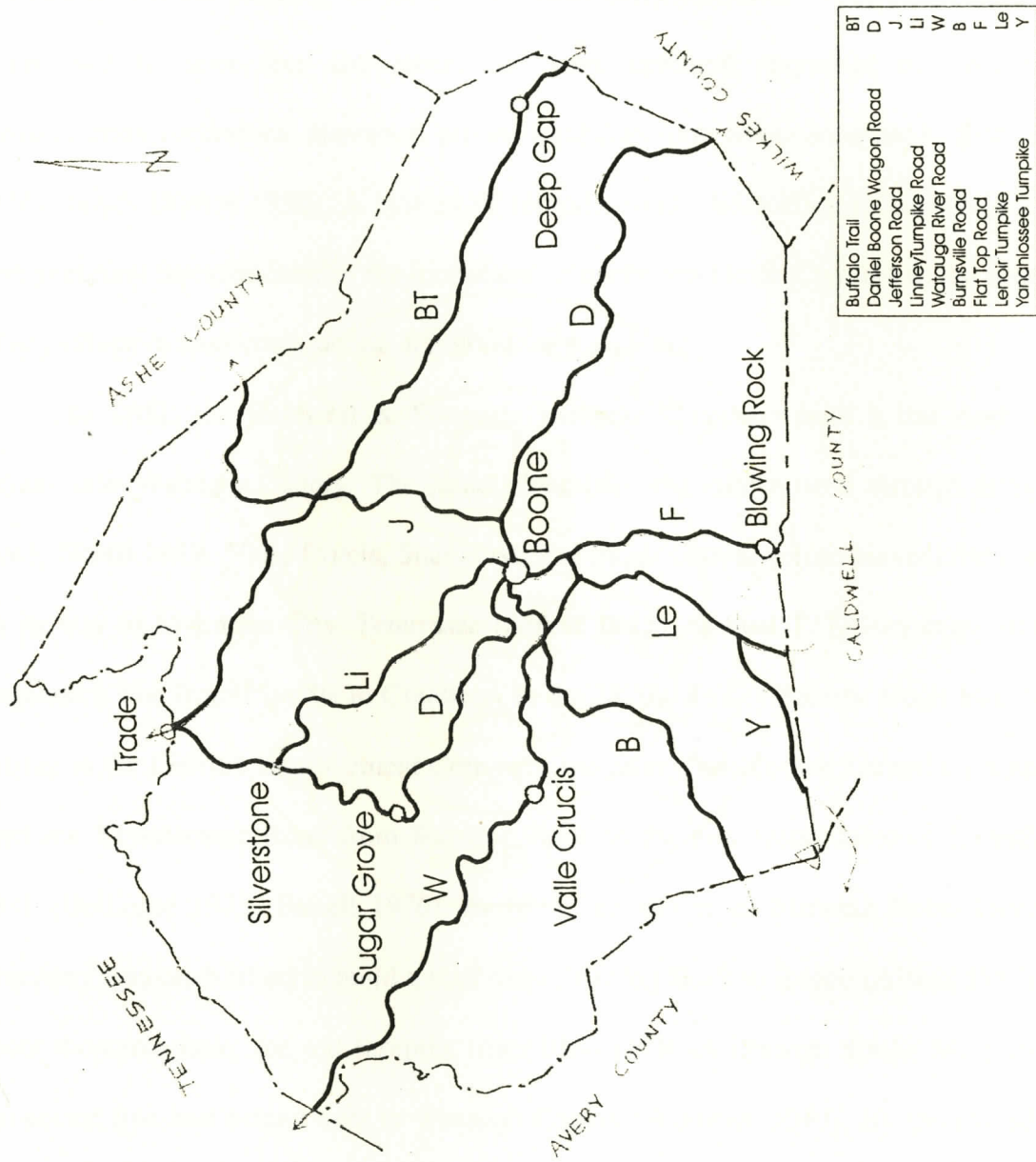


Figure 6: Early Roads in Watauga County.



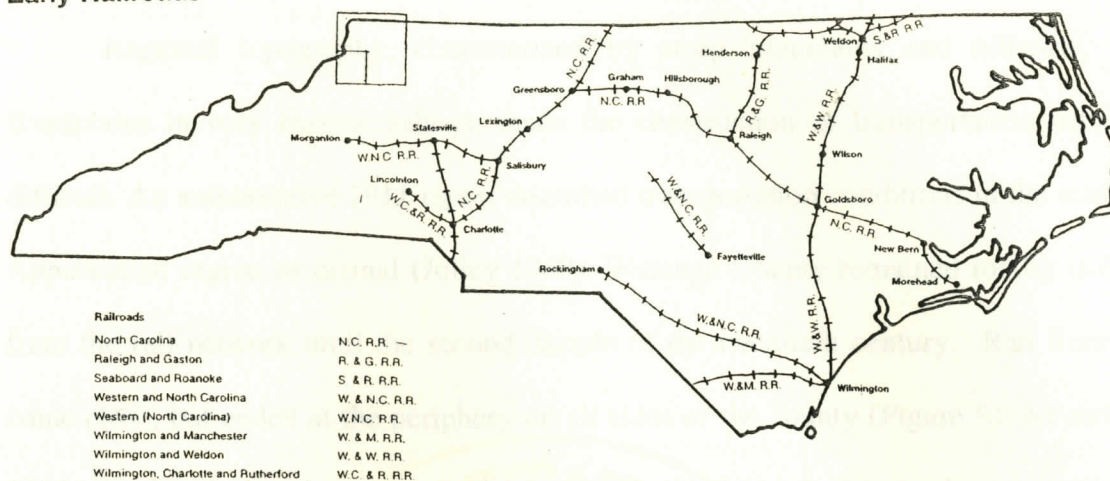
In 1902, Romulus Z. Linney of Boone was influential in getting a wagon road built along the main Rich Mountain ridgeline from the gap west of Howard Knob and east of Rich Mountain above Boone to a gap at the head of the Howard Creek drainage (Altmayer 1994). The Linney Turnpike Road connected with the Wilkesboro-Trade Road at this gap; the route then descended through Silverstone to Trade. This route exists today as Junaluska Road (SR 1102).

These turnpike roads had integral and essential connections to the overall transportation aspects of William S. Whiting's railroad lines in Watauga County. Intersections and links between these turnpike roads and the Boone Fork Lumber Company logging railroad tracks provided access to the various timber tracts of the community structure traversed by the railroad. The linked network of turnpike roads, logging rail lines, and existing horse and wagon trail systems contributed to the vertical integration of the Cranberry to Shulls Mills to Boone to Rich Mountain community structure.

### **Arrival of the Railroads**

Throughout the turnpike transportation period, mountain residents thought the best solution to their transportation problems was a railroad. The area remained isolated well into the late nineteenth century, a time late in the railroad transportation era of the United States (Figure 7). In 1827, the first plan for a railroad cutting through the southern Appalachian region to connect the Ohio River Valley with an Atlantic port in the south was proposed. Construction on a railroad line from Cincinnati, Ohio, to Charleston, South Carolina, did not begin until 1853. Construction was halted by the Civil War and the

## Early Railroads



## Contemporary Railroads

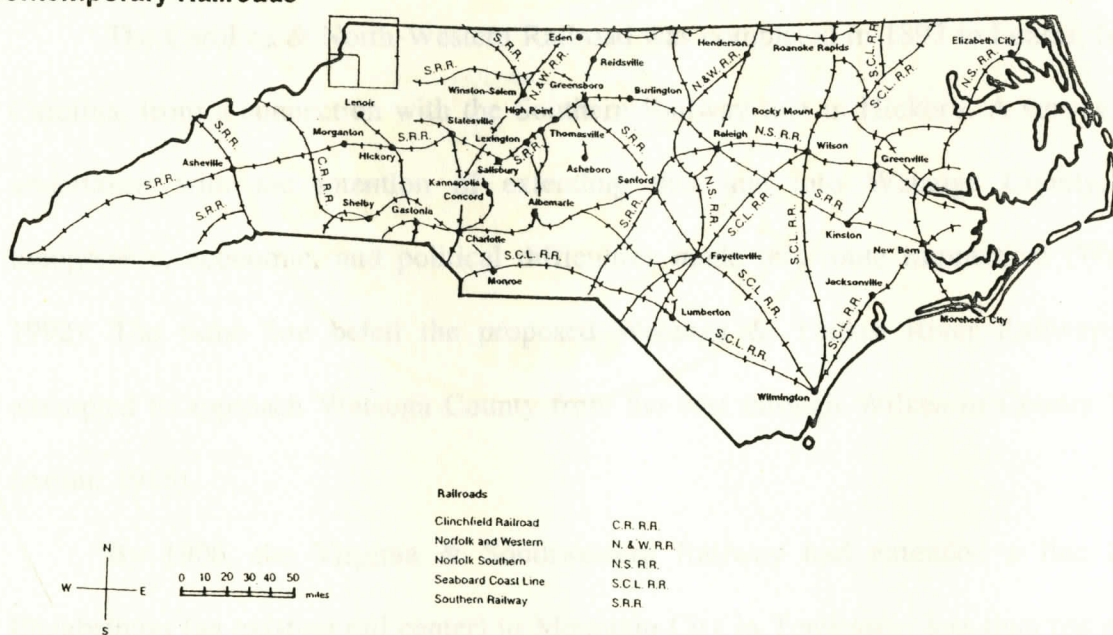


Figure 7: Ongoing isolation of northwest North Carolina from railroad network.

(Adapted from *Facts on File*, 1984).



region remained dependent on rough roads and rudimentary river transportation for commerce (*Archives of Appalachia* 1997).

Regional topography, characterized by steep mountains and hillsides, with floodplains in very narrow valleys, made the construction of transportation networks difficult. An authoritative 1911 report described transportation conditions in the southern Appalachian region as dismal (Jolley 1969). Watauga County remained totally isolated from the rail network until the second decade of the twentieth century. Rail lines had come close, but ended at the periphery on all sides of the county (Figure 8). As early as 1852, the North Carolina state legislature authorized the building of a railroad into Watauga County (Lefler and Newsome 1934). Over the years there were many proposed rail lines into the county, but none were built.

The Carolina & North-Western Railroad was completed in 1897 to Lenoir, North Carolina, from a connection with the Southern Railway line in Hickory. A survey was undertaken with the intention of extending this line into Watauga County, but topographic, economic, and political difficulties made this route impractical (Walker 1992). The same fate befell the proposed Watauga & Yadkin River Railway that attempted to approach Watauga County from the east through Wilkes in County 1912 (Arthur 1915).

By 1906, the Virginia & Southwestern Railway had extended a line from Elizabethton (an existing rail center) to Mountain City in Tennessee, less than ten miles west of the Watauga County line (Hilton 1990). To the south, the Clinchfield Railroad skirted the western edge of the region on its way from Marion, North Carolina, to Johnson City, Tennessee (adjacent to Elizabethton and another key rail center) by the



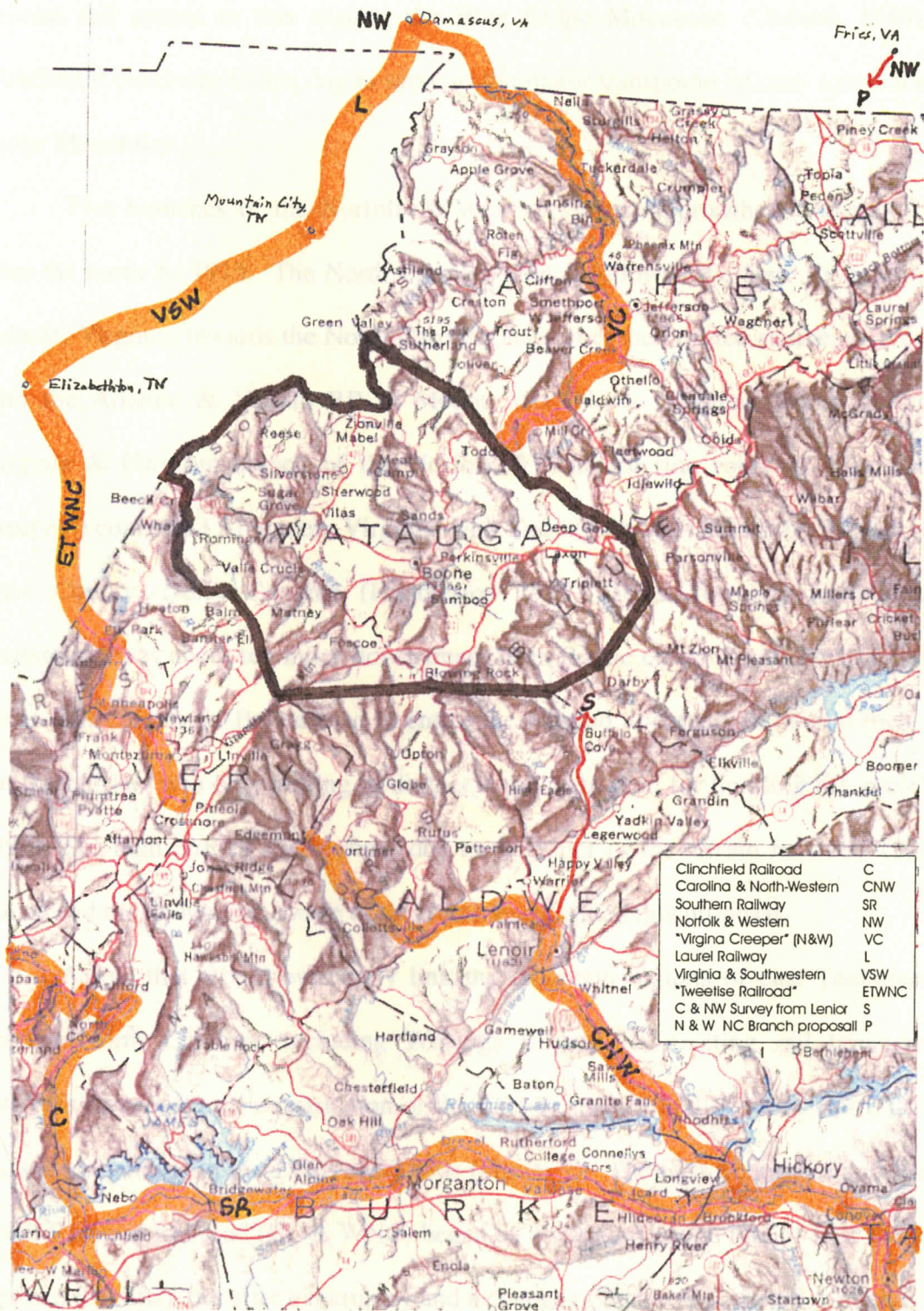


Figure 8: Topographic barriers posed by the Blue Ridge crest.  
Railroads approached all sides of Watauga County.



early 1900s; this was the first line to successfully cross the most significant barrier<sup>2</sup> to general rail access to this region, the Blue Ridge Mountains (Goforth 1989). The Clinchfield continues to this day to serve as the major transporter of coal across the Blue Ridge Mountains.

Two branches of the Norfolk & Western system approached Watauga County from the north by 1915. The North Carolina branch followed the New River from near Pulaski, Virginia, towards the North Carolina state line, then turned southeast to connect with the Atlantic & Yadkin RR at Mount Airy, North Carolina (Webb 1995). The Virginia & Carolina branch of the Norfolk & Western (the route of "The Virginia Creeper") connected Abingdon, Virginia, with Todd (renamed Elkland by the railroad) in Ashe County, North Carolina (Huddleston 1989). Todd, formerly known as Elk Crossroads, was about ten miles downstream from Boone on the South Fork of the New River. The citizens of Boone tried to entice the railroad to extend the line to their town, but the railroad was only willing to do this if the town paid for building the line (Waite 1999). The high cost of the venture, due to the relief of the terrain between Todd and Boone and the undulating course of the South Fork, ended this proposal.

A line that would eventually link the mountain regions of east Tennessee and western North Carolina, including Watauga County, to existing rail transportation networks came with the construction of the East Tennessee and Western North Carolina Railroad beginning in the 1870s and 1880s (Figure 9). The East Tennessee and Western North Carolina Railroad (ET & WNC) began as a standard gauge line (4 feet, 8½ inches between the rails), but after bankruptcy and a change in ownership, the track already in

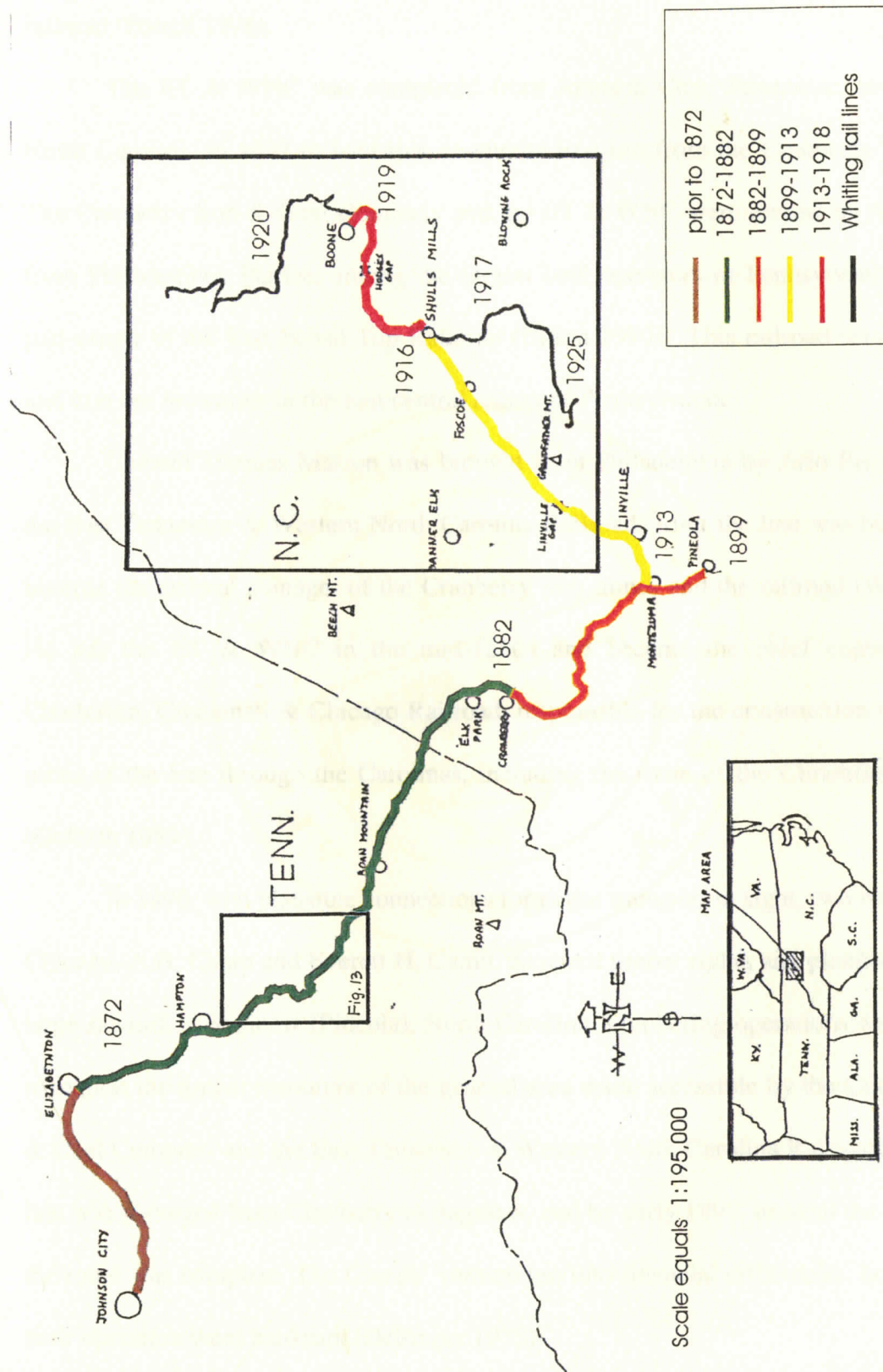


Figure 9: Temporal expansion of the ET & WNC Railroad and Linville Railway (1872-1919)



place was converted and the line continued as a narrow gauge (3 feet between the rails) railroad (Ferrell 1976).

The ET & WNC was completed from Johnson City, Tennessee, to Cranberry, North Carolina, in 1882 to haul rich magnetite iron ore from the Cranberry iron mines. The Cranberry Iron & Coal Company and the ET & WNC were owned by Ario Pardee, from Philadelphia. Pardee, among the largest coal operators in Pennsylvania, also was part owner of the East Broad Top Railroad (Hilton 1990). This railroad served the coal and iron ore industries in the east central region of Pennsylvania.

Colonel Thomas Matson was brought from Philadelphia by Ario Pardee to build the East Tennessee & Western North Carolina Railroad. After the line was built, Matson became the general manager of the Cranberry iron mines and the railroad (Waite 1992). He left the ET & WNC in the mid-1880s and became the chief engineer of the Charleston, Cincinnati & Chicago Railroad, responsible for the construction of over 140 miles of the line through the Carolinas, including the route of the Clinchfield Railroad (Goforth 1989).

In 1896, with plausible connections for major transport in sight, two brothers from Chicago, A.B. Camp and Everett H. Camp, acquired timber rights and planned to build a large sawmill at Saginaw (Pineola), North Carolina. Lumbering operations were initiated to exploit the timber resources of the general area made accessible by the Cranberry Iron & Coal Company and the East Tennessee & Western North Carolina Railroad. A railroad line was surveyed from Cranberry to Saginaw, and by early 1897, most of the grading for the route was complete. The Camps' venture ran into financial difficulties, however, and their operation went bankrupt (Dellinger 1975).

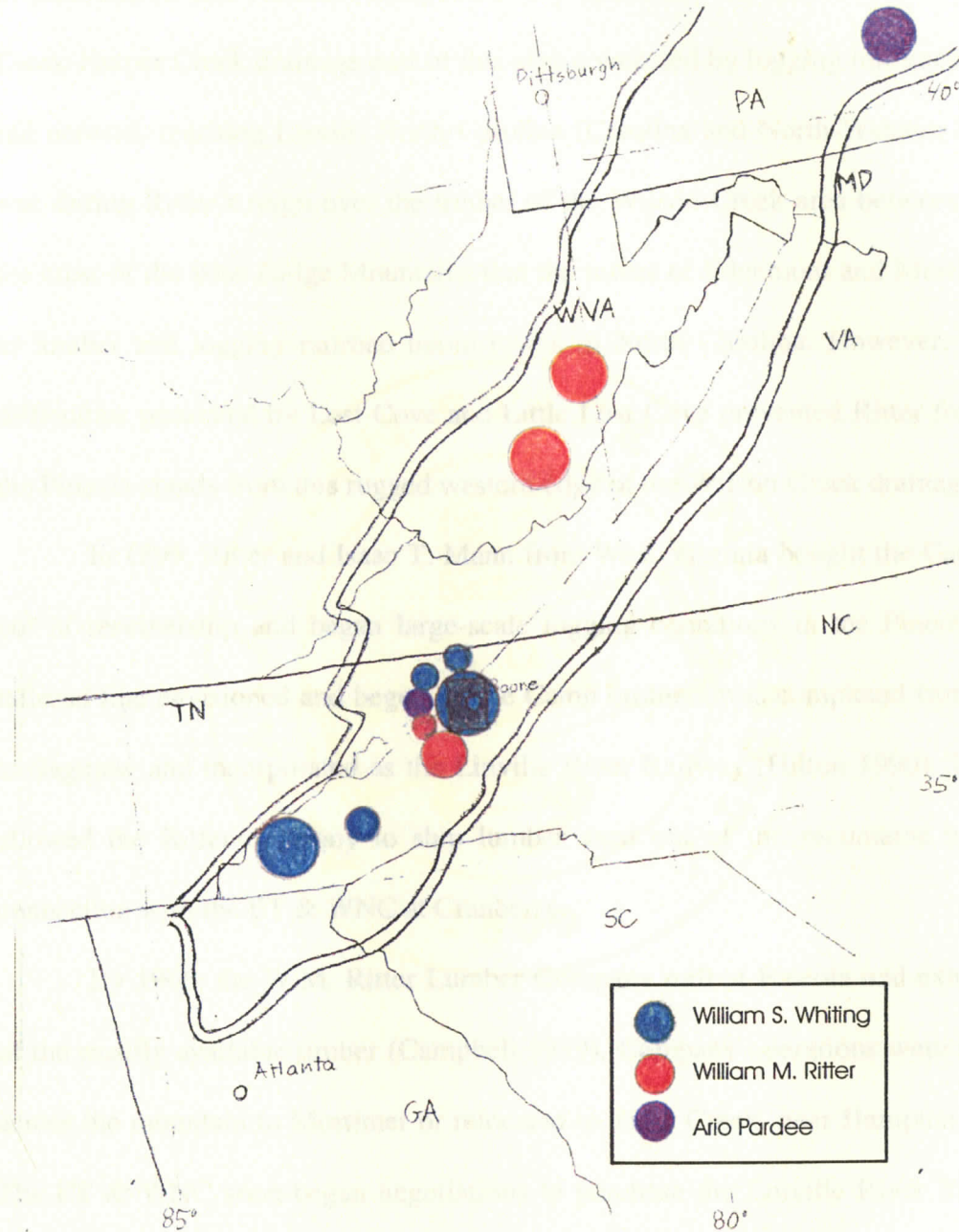


Figure 10: Extractive industry holdings in Appalachian Highlands Ecoregion.  
 Note: Circle size indicates relative land area



In 1898, William M. Ritter, a lumberman with operations throughout West Virginia and the southern Appalachians (Figure 10), developed an interest in a large stand of pine timber near Pineola (Campbell 1989). Ritter had his timber tracts in the Wilson Creek-Harper Creek drainage east of this area connected by logging rail lines to the main rail network reaching Lenoir, North Carolina (Carolina and North-Western Railroad). It was during Ritter's reign over the timber of the Wilson Creek area between Lenoir and the crest of the Blue Ridge Mountains that the towns of Edgemont and Mortimer thrived as lumber and logging railroad boom towns in North Carolina. However, topographic difficulties presented by Lost Cove and Little Lost Cove prevented Ritter from reaching the Pineola stands from this rugged western edge of the Wilson Creek drainage.

In 1899, Ritter and Isaac T. Mann from West Virginia bought the Camp property out of receivership and began large-scale logging operations in the Pineola area. The railroad line envisioned and begun by the Camp brothers was completed from Cranberry to Saginaw and incorporated as the Linville River Railway (Hilton 1990). This railroad allowed the Ritter company to ship lumber west out of the mountains by way of a connection with the ET & WNC at Cranberry.

By 1906, the W.M. Ritter Lumber Company mill at Pineola had exhausted most of the readily available timber (Campbell 1989). Company operations were moved back across the mountain to Mortimer or relocated to Tiger Creek, near Hampton, Tennessee. The ET & WNC soon began negotiations to purchase the Linville River Railway from Ritter. The logging line would provide the ET & WNC immediate access to the timber tracts near Old Fields of Toe. This community was renamed Newland when it became the county seat of newly created Avery County in 1911 (Cooper 1964).

With a short extension toward Linville from Pineola, the railroad could reach the large MacRae tract across from Grandfather Mountain near Linville Gap. Hugh MacRae of Wilmington, North Carolina, formed the Linville Improvement Company with Samuel T. Kelsey. By 1891, they established the resort town of Linville at the foot of Grandfather Mountain and built the Yonahlossee Turnpike (present-day Highway 221) to connect Linville with Blowing Rock. MacRae was an industrialist and railroad magnate who recognized the potential profits from tourism and timber, and possessed the wherewithal to realize them. The Linville Improvement Company purchased 16,000 acres of land that comprised much of Grandfather Mountain and the surrounding area (Tager 1999). Extraction of the timber resources began and a logging railroad line was constructed from the Linville Gap area up the drainage towards Sugar Mountain. This line was eventually connected to the Linville River Railway.

It took until 1913, but Cranberry Iron & Coal, the parent company of the ET & WNC, finally acquired the Linville River Railway from William Ritter (Beebe 1961). The connection of the Linville River Railway line to Linville was being completed from Montezuma as William S. Whiting was beginning to purchase timber lands in Watauga County. The ET & WNC was interested in the development of the timber industry in Watauga County. The potential connections via the Linville River Railway would prove beneficial to both Whiting and the ET & WNC. The ET & WNC encouraged Whiting to build his mill at Foscoe, but the mill was constructed on a site at Shulls Mills that was seen to be preferable to Whiting. This mill and its lumber operations would justify the extension of Linville River Railway tracks into Watauga County.



## Chapter 5: William Whiting's Lumbering Ventures

William S. Whiting's first lumbering venture in the southern Appalachians came in 1892. With his brother Frank R., W. S. Whiting acquired half interest in a single band saw mill on the Catawba River at Hickory, North Carolina. In 1895, they organized the Whiting Lumber Company at Philadelphia, Pennsylvania, to handle the products of the Hickory mill. Frank moved to Philadelphia to work with sales, while William remained in North Carolina to manage the cutting and production end of the business (*Whiting Lumber Company Records*). Thus began a three decade long shaping of the cultural geography and the physical landscape by logging and related narrow gauge railroad operations throughout an extensive region of the southern Appalachians (Figure 10).

In 1897, the Whiting Lumber Company built a hardwood lumber plant at Elizabethton, Tennessee. This mill continued in operation until 1903, when its contributory timber supply became exhausted (Parker 1992). In 1904, Whiting purchased timber lands further to the northeast in Tennessee near southwest Virginia, an area characterized by geographic barriers to transportation that isolated Watauga County and the town of Boone from northwest access. Whiting would help reduce this very isolation more than a decade later, but from southwest of Boone. Near these Tennessee holdings, the Whiting Lumber Company constructed a single band mill, with adjoining planing mill, flooring mill, and dry kilns. The mill was one-half mile west of Abingdon, Virginia. The timber lands included a tract of more than 7,000 acres on Iron Mountain in Johnson

County, Tennessee, an adjoining 1,500 acres in Sullivan County, Tennessee, and tracts on Pond Mountain, where Virginia and Tennessee border Ashe County, North Carolina (Cooper 1997). A logging railroad was built to reach the timber. Several Climax locomotives were used in this operation. This Whiting-built logging railroad fed his timber to the "Virginia Creeper" (Norfolk & Western Railroad).

In 1909, Whiting began acquiring timber lands in Graham County, North Carolina, by purchasing a 15,000 acre tract from the Buchanan Lumber Company of Judson, North Carolina. Judson was on the Murphy Branch of the Southern Railway. The community was eventually submerged under the waters of the Tennessee Valley Authority's Fontana Reservoir.<sup>3</sup> Whiting's timber holding acreage soon doubled with the addition of another 15,000 acres – the Snowbird Tract on the Little and Big Snowbird rivers. Later the same year, another 55,000 acres were acquired as the Belding Tract on Santeetlah, Buffalo, Slick Rock, and other nearby creeks (Parker 1992) This included the area that is now the Joyce Kilmer National Memorial Forest. Ultimately, Whiting's holdings in Graham County totaled 93,000 acres, including the actual ownership or the option to buy most of the real property comprising the county seat, Robbinsville. In 1910, the *Southern Lumberman* reported the Whiting Company of Philadelphia, Pennsylvania, bought the entire town of Robbinsville. With the sale of the town, a hydroelectric power plant was planned and the Whiting Company projected the employment of 1,500 men in the logging and lumber business (Poole 1995). In scope and intent, Whiting's scheme was to implement the concept of the company town. Railroad connections were planned from Robbinsville, either to Topton on the Murphy Branch (the route later chosen by the Graham County Railroad Company) or to the South Railway's branch line along the



Little Tennessee River. However, it was another six years before construction commenced on the railroad.

To produce lumber from these vast timber holdings, Whiting Lumber Company acquired a single band mill at Welch, North Carolina, nine miles from Judson on a narrow gauge railroad, and began multiple mill construction projects. A flooring mill and dry kilns were added to the Buchanan Lumber Company operation. In 1911, the Abingdon, Virginia, mill was closed after the nearby timber supply was exhausted; parts of the Abingdon plant were dismantled and moved to Judson, where they were recycled in the construction of a new band mill (Parker 1992). A three band mill was under construction at Robbinsville at the time. All of these mills were intended to produce lumber from timber cut from Whiting's huge Graham County holdings.

In early 1916, the to-market rail connection effort intensified and construction of a line from Robbinsville to Topton was begun. Later in the year, the construction came to a quick halt due to natural hazard consequences. The Whiting Company had purchased a used Baldwin-built rod locomotive for use on the line. The locomotive was in need of repairs and was sent to Asheville, North Carolina, to be overhauled by the Southern Railway shop mechanics. In July, 1916, a catastrophic flood wiped out three of the four railroads into Asheville. In this flood, the Graham County Railroad engine was washed downstream, never to be found (Poole 1995). With the loss of its sole piece of motive power, the railroad was forced to halt construction on the line. It is possible that the Whitings became financially overextended; the Graham County holdings (timber acreage and mills) were sold to the Graham Lumber Company in late 1916 (*Whiting Lumber*

*Company Records*). William S. Whiting must have turned his full attention to his other North Carolina ventures at this point.

Earlier, William S. Whiting had begun dealing for himself, as well as for the Whiting Lumber Company partnership with his brother. In 1912, he acquired timber land and built a logging railroad extending westward from Waynesville, North Carolina, to a sawmill operation in Maggie Valley (Poole 1995). Part of this old right of way was used much later by a post-war standard gauge tourist railroad, the "Highlander," and in the mid-1960s by the "Maggie Valley Railroad."

In the fall of 1913, William S. Whiting, again acting for himself, purchased extensive timber rights at Shulls Mills, North Carolina, from the Lenoir Lumber Company. Two years later, in 1915, he incorporated the Boone Fork Lumber Company to develop the marketable timber resources of this property (Parker 1992). Mill construction at Shulls Mills began during the spring of 1916 and was completed that summer, in spite of wet conditions in the region that contributed to the flood ending the construction of Whiting's rail line from Robbinsville to Topton.

Needing a way to get his Boone Fork finished lumber to market, Whiting approached the management of the East Tennessee & Western North Carolina to have their recently acquired Linville River Railway extended to his millsite at Shulls Mills. Whiting was successful, and fourteen miles of rail line were completed from Montezuma, through Linville, to Shulls Mills by late 1916 (Campbell 1989). Construction of the Boone Fork branch of the Boone Fork Lumber Company railroad system serving the mill began during this time and continued into 1917.



In October, 1915, the townspeople of Boone began to petition for the Linville River Railway to extend its tracks eight more miles from Shulls Mills to Boone, even as the grading for the extension to Shulls Mill had just begun (Ferrell 1976). William S. Whiting soon realized that significant timber could be accessed from a rail line extending from Shulls Mills to Boone. Operators of the Linville River Railway, recognizing the viability of such an arrangement, authorized the extension to Boone with the conditions that the property owners along the route would have to donate the right of way and a depot site in town, as well as contribute \$30,000 toward the cost of the extension. As Whiting had already purchased timber on Rich Mountain north of Boone, the railroad operators demanded that his Boone Fork Lumber Company contribute \$10,000 to the project (Waite 1999).

After a spirited campaign led by Dr. B.B. Dougherty, of the Appalachian Training School, and Bob Rivers, editor of the *Watauga Democrat*, the citizens of Boone passed a bond referendum in February, 1918, to meet the Linville River Railway's conditions. Whiting's Boone Fork Lumber Company gave the railroad four hundred acres of land estimated to be worth \$25 an acre (Robertson 1945). Once the Linville River Railway tracks were completed to Boone a year and a half later, William S. Whiting was able to reach additional and substantial timber right acquisitions north of Boone by constructing the Rich Mountain-Howard Creek branch ("Whiting Railroad") of the Boone Fork Lumber Company by late 1920 (Figure 9).

William S. Whiting acquired significant real property and timber rights on properties in two major areas of Watauga County that provided timber for his Boone Fork Lumber Company milling operation. The Boone Fork of the Watauga River first supplied

the millsite and justified the logging line from Shulls Mills. The Rich Mountain area was the source of the final wave of timber milled by Boone Fork Lumber Company, once the Linville River Railway main line was extended from Shulls Mills to Boone

Whiting's timber holdings in the Shulls Mills-Boone Fork area were substantial. He purchased timber rights for 2,600 acres (more than four square miles) in the Boone Fork drainage (Hayes 1992). Harvestable timber on this property was quite valuable. William G. Lord (1963, 51) tells of a first-hand account at the time by legendary logger "Bull" Suddreth noting how impressive this timber tract was, "Beat anything you ever saw. It was the best boundary of timber in Carolina. I think Whiting cut 30,000,000 feet there, maybe more. There were poplars six feet through. We cut one down there on Boone Fork we figured was a hundred feet to the first limb."

Several large timber tracts on the east slopes of Grandfather Mountain were eventually acquired from the Linville Improvement Company as Whiting's logging operations progressed beyond the initial six miles upstream from the mill to higher elevations; the expansion provided access to valuable stands of black cherry and spruce forest. (Figure 2). A large portion of the Shulls Mills-Boone Fork tract is now Julian Price Memorial Park of the Blue Ridge Parkway. The 3,900 acre park stands on land donated as a permanent memorial to Price, the president and founder of Jefferson Standard Life Insurance Company of Greensboro, North Carolina, by the company in 1945 (Jolley 1969). Price had acquired this acreage from Whiting and Boone Fork Lumber Company holdings and maintained the mountain property as a recreation area for company employees in the years prior to the construction of the Blue Ridge Parkway. Price Lake was created on this property by the National Park Service in 1959.



Whiting's timber rights in the Rich Mountain-Howard Creek area also were substantial (Figure 2). Roughly five to six square miles (over 3,500 acres) of timber were eventually harvested from several major tracts in the Rich Mountain-Howard Creek area (Greer 1994; Lawrence 1995; Moretz 1998). These tracts included extensive timber stands on the Little property and the Linney property on Rich Mountain and Tater Hill (Cullars 1995; Moretz 1998). Whiting's business dealings with Little and Linney were also in evidence on Boone Fork, as timber rights were acquired on 1,430 acres of Little and Linney property there.

In 1917, it was reported that the Boone Fork Lumber Company had three hundred men working (Hayes 1992). The company was cutting poplar, ash, oak, and chestnut timber and hauling it, along with extract wood for tanning and pulpwood, to the Shulls Mills millsite by rail. The company had about six miles of railroad completed, reaching southward from Shulls Mills along Boone Fork Creek, generally at lower elevations along the north slopes of Grandfather Mountain.

The cut timber was processed into lumber products at the bandsaw mill at Shulls Mills; these products were then shipped to major distribution points via Cranberry, North Carolina, and Elizabethton, Tennessee, on the Linville River Railway and East Tennessee & Western North Carolina Railroad. The extract wood was shipped to Elizabethton and Johnson City, Tennessee, while the pulpwood was shipped, ultimately, to the Champion Fiber Company plant at Canton, North Carolina. The Boone Fork Lumber Company intended to establish an extract plant at Boone upon completion of the railroad, because Boone was surrounded by a large supply of chestnut wood (Waite 1999). This plant never materialized, although subsequent Whiting timber holdings were utilized to further

supply his sawmill and justified the construction of the additional logging railroad track from the town of Boone to Rich Mountain.

In 1920, the Boone Fork Lumber Company purchased a new geared locomotive from Lima, Ohio, and ten log carrying cars from the Kilby Car Company (Ferrell 1976); the equipment was used to bring timber from Howard Creek and Buckeye Gap on Rich Mountain. This investment came near the height of William S. Whiting's Boone Fork Lumber Company operations in Watauga County. The Rich Mountain area was one of the last timber stands exploited during the logging railroad era in western North Carolina. Even on Mount Mitchell (6,684 feet), the highest peak in eastern America, logging operations had been underway since 1912, with the Perley & Crockett logging railroad reaching the 5,800 foot elevation level just eight-tenths of a mile below the summit by 1914 (Lovelace 1994). William S. Whiting himself had developed the milling operations leading to the extraction of most of the timber from the Snowbird Mountains above Robbinsville in remote Graham County, North Carolina, just prior to his Shulls Mills venture. By 1918, the Boone Fork Lumber Company had harvested over 1,400 acres of forest in Watauga County accessed by the logging railroad, but during the following seven years, lumber production began a steady decline (Parker 1992). The Boone Fork Lumber Company might have been too effective in cutting out the available timber supply. In March, 1921, the *Watauga Democrat* noted, "The U.S. Forestry Service has begun the great work of reforesting the cut-over and burned area in the Boone section, in which there was up to a few years ago one of the largest and finest spruce forests on this continent." The region's timber resources were exhausted by 1925.



As timber harvests declined in Whiting's Shulls Mills area holdings, the timber lands and properties of the Boone Fork Lumber Company were sold in 1923 to the Cherokee Timber Company. Timber was harvested as late as 1925 for Whiting on Rich Mountain, and the Shulls Mills operation continued after the sale (Graybeal 1998). In 1925, William Whiting was still living at Shulls Mills when he incorporated the William S. Whiting Lumber Company (*Whiting Lumber Company Records*). Under dual ownership with Cherokee Timber Company (doing business as Tri-County Lumber Company), the large bandsaw operation remained viable, because the Boone Fork logging railroad branch had been extended to its terminus on the east slopes of Grandfather Mountain. Spruce timber cut from these slopes, as well as the remaining timber hauled in from Rich Mountain by Whiting's other logging railroad branch, supplied the materials for the culminating operations of the mill. This entire operation was eventually dismantled and recycled to form the infrastructure of Whiting's final lumbering industry venture.

In 1928, Whiting purchased Tri-County Lumber Company and its timber rights in Watauga and Avery counties, North Carolina, and in Johnson County, Tennessee. This sale included the acquisition of the mill equipment, including a single band resaw for the manufacture of finished lumber, and its transfer from Shulls Mills to Butler, Tennessee (*Whiting Lumber Company Records*). The tracks of the Whiting's rail lines were removed from Boone Fork and Rich Mountain, then utilized to access new timber holdings on the western slopes of Beech Mountain from a new millsite at Butler. Many employees of the Whiting Lumber Company's Shulls Mills location were invited to continue their employment by moving to Butler, Tennessee, and many did. Whiting remained a resident

of Shulls Mills; he managed his business from an office in his home until his retirement in the 1940s (Hayes 1992).

William S. Whiting's lumbering ventures during four decades in the southern Appalachians ended with the bankruptcy of his Butler operation in 1933. However, it was Whiting's logging railroad lines into the Rich Mountain area and onto the slopes of Grandfather Mountain that represented the maximum extent of rail development of any kind into Watauga County.



## Chapter 6: Communities Integrated by Lumber Rail Lines

Transportation is a way to define space relations. The relations and connections between areas are reflected in the character of transport and the flow of traffic. Railroads are a principal method through which location factors operate to influence the distribution of basic economic activities (Ullman 1949). This concept was exemplified by the rail distribution network created by the Laird, Norton Lumber Company in the late nineteenth century. This rail network linked the Great Lakes lumber producing region of Wisconsin's Chippewa Valley with the Plains territory of east-central South Dakota. A vertically integrated system of communities developed along the routes of the rail lines that helped feed the lumber demands of the timber deficient Great Plains (Vogel 1992).

Cranberry, Shulls Mills, and Boone, North Carolina, developed as the result of similar processes. The spatial integration of rail distribution networks of eastern Tennessee and western North Carolina, the presence of high-quality magnetite iron ore deposits and vast untapped timber resources contributed to the development and vitality of these communities. The communities were linked by the East Tennessee & Western North Carolina Railroad, the Linville River Railway, and Whiting's logging lines. Cranberry (c. 1900) and Shulls Mills (c. 1915) each served as the terminus of the rail network that eventually was extended to Boone (c. 1918), and culminated at Flatwoods (c. 1920).

Company towns were an integral part of southern Appalachian logging. The town would appear when a large bandsaw mill was built and generally disappeared when the mill was torn down. Typical company towns included residences, stores, a post office, a company store, a community building, a hotel, and a railroad depot. Shulls Mills and Pineola (Saginaw), North Carolina, and Rittertown (near Hampton, Tennessee) followed this general pattern (Waite 1991).

Lumber companies such as the W.M. Ritter Company existed to make money. Little consideration was given to the welfare of the employees. Wages were low and hours long. Most workers had little alternative but to work in the woods or mill. The large lumber companies paid their employees in company scrip instead of currency. The use of scrip solved the cash flow problems of the company and tied the worker to the company store (Clarkson 1990).

William S. Whiting's lumber company operated differently than the others. As a practitioner of the World War I era Industrial Democracy movement, Whiting worked to develop the entire community, not just his sawmill business. Industrial Democracy was based on five principles: justice, cooperation, economy, energy, and service. Cooperation between labor and management rewarded hard work and increased productivity within a socially efficient community structure. Local men were encouraged to seek work there. Whiting's woodsmen and mill employees were paid bonuses in addition to regular wages, said to be among the best in the area (Graybeal 1998).



## Shulls Mills

The Whiting Lumber Company, a Pennsylvania-based timber company owned and operated by William S. Whiting, established a single bandsaw mill at Shulls Mills, North Carolina, in 1915. The company hired many of the rural community's residents to work in its new mill; as a result, Shulls Mills experienced sudden economic prosperity. In three years the town had built a railroad depot, barber shop, movie theater, hospital, and housing for the influx of people coming to Shulls Mills to work for Whiting Lumber. Before Whiting's Boone Fork Lumber Company came to Shulls Mills, it is likely that no more than 50 to 100 people lived in the immediate area. By 1917, the population was estimated at over 1,000 individuals or about 300 families, far more than the Watauga County seat of Boone (Hayes 1992). During the early years of the twentieth century, the community of Shulls Mills was the industrial center of Watauga County.

The part of Watauga County, North Carolina, that is now called Shulls Mills was considered a part of Washington County, Tennessee, in 1788. The area that was to become Shulls Mills was first settled in the 1790s. Among those first settlers was Jesse Boone, a nephew of Daniel Boone, who built a cabin along a tributary of the Watauga River still known as Boone Fork (Arthur 1915).

In the early 1700s, Frederick Shull (Schull) arrived in Valle Crucis, North Carolina, from Germany. In 1820, Frederick Shull's grandson, Phillip Shull and his wife Phoebe moved to the lower Boone Fork valley from nearby Valle Crucis. They obtained a large tract of land and cleared an area near the center of the present community (Hound Ears Club, Ltd. golf course). A few years later, after some success at farming, the Shulls established a grist mill where they ground corn, wheat, rye, and buckwheat for the other

farmers in the area (Hayes 1992). It is from this mill that the community of Shulls Mills gets its name.<sup>4</sup> This name was made official when the community received a post office in 1879. The owner of the general store, Joe Shull, was the first postmaster. The Shulls Mills community of the late nineteenth century consisted of the post office in Shull's general store, a grist mill owned by Virgil Calloway, the Shulls Mills Mercantile Company owned by Eber Gragg and George Robbins, and a hotel also owned by Robbins. The resident population was 50 to 100 during this time. By the early 1900s, phone lines connected Shulls Mills to the Cove Creek exchange (Whitener 1949).

Shulls Mills remained an agricultural trading community on the Valle Crucis to Lenoir toll road into the twentieth century. In 1915, William S. Whiting came to the area to buy timber and locate a site for a band mill. With the coming of Whiting's Boone Fork Lumber Company sawmill, rapid changes occurred in the Shulls Mills community. By 1917, the population grew to over 1,000 and Shulls Mills was booming. In addition to the large mill complex, Shulls Mills had a train depot, a barber shop (owned and operated by Bill Hodges), a feed and grain company, the first movie theater in the region (Ira and McKinley Ayers), a small hospital (Dr. R.H. Hardin), and several other service facilities. A large number of residences erected by Mr. O.L. Coffey, a commissary, and a post office further served the growing populace (Schneer and Black 1958).

Several dams were built on the Watauga River and on Boone Fork. The first was built by Virgil Calloway for his grist mill, before the band mill was constructed. The second dam was at the band mill site to create the log pond. A third dam was constructed on Boone Fork, approximately 2½ miles upstream from the mill site, to generate hydroelectric power. This facility supplied power to the sawmill, and the community



enjoyed the modern convenience of electricity before most others in the county (Hayes 1992).

Physical site, demand, and access to transportation were interrelated locational factors affecting the geography of millsites of the time. Even the early grist mills needed a streamside location with certain characteristics: a marked descent along a stream to provide sufficient vertical displacement to turn a mill wheel; a constant, reliable source of water; and adjacent bank topography suitable for dam, raceway, and buildings (Wycoff 1986). The East Tennessee & Western North Carolina Railroad management had at first encouraged William S. Whiting to build his sawmill at Foscoe, a few miles west of Shulls Mills. Whiting recognized the elements of the physical environment working well in the grist mills at Shulls Mills. The hydroelectric potential of the gradient of Boone Fork Creek and the larger area conducive to the construction of buildings and facilities at Shulls Mills made that site preferable to the one at Foscoe.

The band mill occupied a large area which had been leased from George Robbins on the west bank of the Watauga River. Company houses were built along the west bank of the Watauga River and along Boone Fork (Figure 11). A logging railroad was built along the west bank of Boone Fork to supply the mill with timber. The first railway depot of the newly arrived Linville River Railway was two boxcars at the end of the main line, where the logging railroad spur began. After the band mill was in operation, a railroad bridge was built to cross to the east bank the Watauga River and a new depot was constructed on land leased from the Shulls (Cannon, Norwood, and Waite 1993). The construction of this bridge was the first step in the eventual extension of the Linville River Railway from Shulls Mills to Boone.

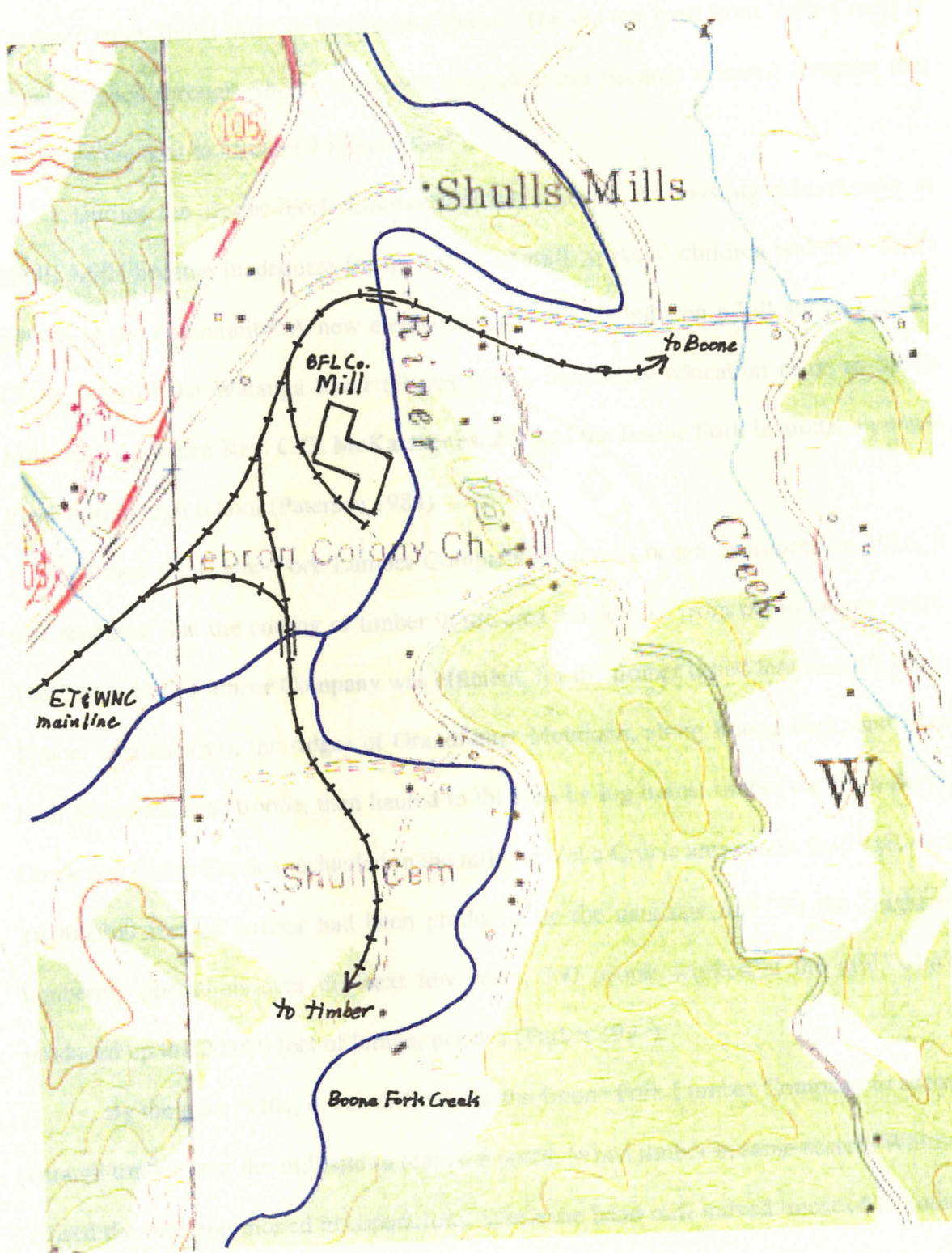


Figure 11: Shulls Mills area details.



Several automobiles were owned by the people of the town; roads were greatly improved from Shulls Mills to Foscoe and Boone. The old toll road from Valle Crucis to Blowing Rock through Shulls Mills was upgraded and became a motor turnpike that connected the area to Lenoir (Whitener 1949).

During the Boone Fork Lumber Company years, the existing schoolhouse at Shulls Mills became inadequate for the influx of mill workers' children and the overall growth of the community. A new elementary school was built on a hill above Lance's Creek, west of the Watauga River (Hayes 1992). Secondary education came to Shulls Mills in 1921, when Rev. C.G. McKaraher established the Boone Fork Institute, a private Presbyterian high school (Paterson 1984)

When the Boone Fork Lumber Company band mill began operations in 1916, it was projected that the cutting of timber in the area would take from ten to twenty years. The Boone Fork Lumber Company was efficient, for the timber lasted less than 10 years. Timber was cut from the ridges of Grandfather Mountain, along Boone Fork, and from Rich Mountain near Boone, then hauled to the mill by log trains; timber cut from Beech Creek and Dutch Creek was hauled to the mill via Valle Crucis area roads. By 1918, over 16,000,000 feet of lumber had been produced by the bandsaw mill. At the height of lumbering operations over the next few years, 300 people worked at the mill, which produced up to 120,000 feet of lumber per day (Parker 1992).

By the mid-1920s, it was difficult for the Boone Fork Lumber Company to access enough timber near the mill site to realize a profit. When timber became scarce, Whiting closed the mill and moved his operations. When the band mill moved, most of the other businesses of Shulls Mills were not able to sustain themselves. Many buildings were torn

down and the area reverted to an agricultural community. In August, 1940, the worst flood of the century destroyed the railroad and demolished most of the remaining structures. The most recent development in the Shulls Mills community has been the building of North Carolina's first gated community, Hound Ears Club Ltd., beginning in the 1950s. Several hundred people live here part of the year; up to about hundred people year-round. Hebron Colony and Grace Home treatment centers have been located on the banks of lower Boone Fork in the post-1940 flood era. No longer a post office, Shulls Mills remains the name of the particular locale of Watauga County which thrived as a community entity in the early part of the twentieth century.

### **Flatwoods**

Flatwoods lies at approximately 4,200 feet elevation in a large, level, wet basin below Tater Hill (5,194 feet), Rich Mountain Bald (5,372 feet), and Harmon Knob (4,800 feet). This yields local relief ranging from 600 to over 1,100 feet. "Flatwoods" is a locally unusual yet appropriate physiographic description of this notable basin in a general area of overall steep terrain (Figure 12). The region of the upper Howard Creek drainage and the tributaries of upper Meat Camp Creek generally has been known by the local population as Rich Mountain since the days of early settlement (Moretz 1995). The name Flatwoods also was coined by the local populace (Cullars 1995).

The Flatwoods basin has natural outlets to the east along Meat Camp Creek and to the south along Howard Creek. Both creeks arise in Flatwoods and each flows to a confluence with the New River after approximately ten miles. Meat Camp is said to have



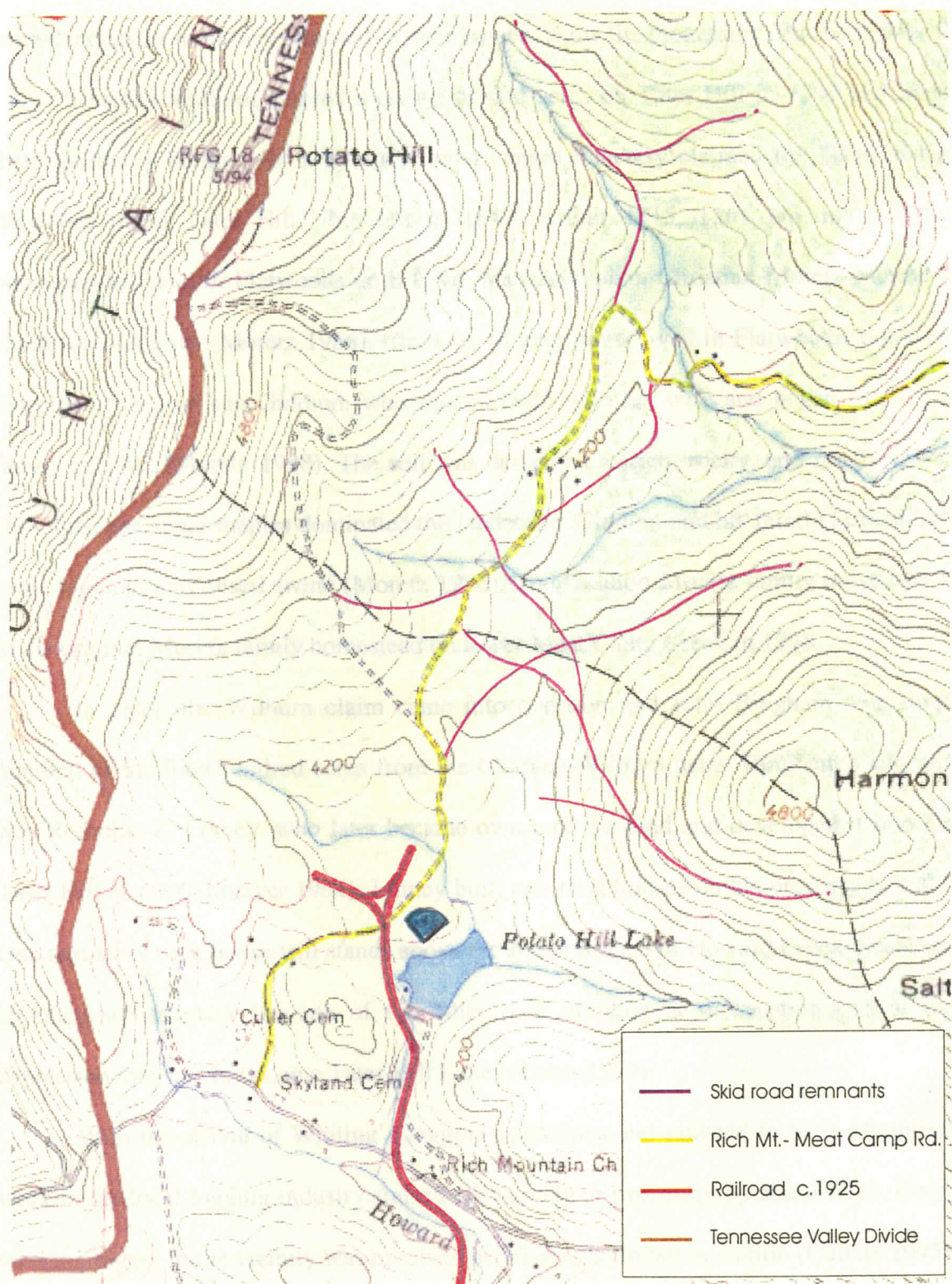


Figure 12: Flatwoods area details.



derived its name from a camp established by early hunters, where they stored dressed animal carcasses until they returned to their homes below the mountains (Proffit 1984).

Chapley Wilburn entered a claim for 400 acres on Tater Hill in 1799 and lived there, probably hunting for a living. A man named Flannery claimed the "land in the flatwoods under Tater Hill," but left in 1849 (Arthur 1915, 126). No one actually possessed the land in Flatwoods until Civil War days when Christian Moretz entered a claim for 243 acres (Moretz 1986). Christian Moretz never lived in Flatwoods, but gave the property to his son Giddion, who moved there with his wife and began to raise a family in 1902 (Moretz 1998). The soil was described as rich, rocky, and rough. Oaks, chestnuts, and sugar maples dominated the landscape. Giddion and his family farmed, did some logging, and raised swine (Moretz 1986). The Giddion Moretz family moved back to the original Moretz family homestead on lower Meat Camp Creek in 1918.

In 1889, the Wilburn claim came into question and John Bingham won three hundred of the four hundred acres from the Chapley Wilburn heirs. Bingham's attorney was Romulus Z. Linney, who later became owner of the land and developed it into the Tater Hill estate (Altmayer 1994). Linney built two rock houses on his property in 1902. One two-story rock house still stands above the Jones Branch of Howard Creek. Scattered chimney stones mark the site of the other rock building at the eastern end of the depression that was to become Tater Hill Lake (Flisser 1979).

With the arrival of Whiting's logging operations and railroad to Rich Mountain, work in the local logging industry shifted exclusively to timbering by about 1920. Every working logger in the vicinity was involved in Whiting's timber operation (Cullars 1995). Most local sawmills stopped operation during this time, as employment consisted



primarily of those tasks necessary to cut and haul logs to the railroad terminus at Flatwoods and to collection points along the line; the collected logs were transported to the Boone Fork Lumber Company's mill at Shulls Mills. It was at the Shulls Mills facility that virtually all of the sawmilling of timber collected by the logging railroad operation was done.

Flatwoods was a natural terminus for Whiting's Rich Mountain logging railroad line. Located in the heart of his timber acquisitions in the area, it served as a central collection point proximate to several thousand acres of timber. Vestiges of a vast network of skid roads in and around Flatwoods, the terminus of the rail line on Rich Mountain, remain evident today (Figure 12). The road leading north towards the summit of Tater Hill was probably a key part of that system. Derelict roadbeds still can be seen in the gap between Harmon Knob and the southern end of Tater Hill, on the lower southwest slopes of Harmon Knob leading towards Salt Rock Gap, along the upper Norris Fork, and following the drainage up into the bowl on the southern flank of Rich Mountain Bald.

The pre-railroad settlement and transportation patterns provided an infrastructure of available labor and the means to integrate movement within the existing spatial landscape. The topography and stream features of Flatwoods were conducive to the location of facilities necessary at the terminus of a spur rail line: space for the means and mechanism to turn around a locomotive, and sites for basic structures and facilities, such as a water tank and a small shop for end-of-the-line service and maintenance needs. There are no remains of track, structures, or facilities in Flatwoods today. Logging railroads were very temporary entities and all usable materials were often recycled for use elsewhere. For example, these rail lines and the bandsaw mill at Shulls Mills were

moved to Butler, Tennessee, by Whiting. The Flatwoods area has been heavily impacted by at least two major, unsuccessful attempts at development since the demise of the railroad. The prior presence of the railroad helped to make the topography of the Flatwoods area attractive to development; large impacted, graded areas and general accessibility were factors that were conducive to post-railroad attempts at development.

As part of the first plan to develop a resort community, an earthen dam was constructed below the two uppermost branches of Howard Creek in 1939 to create Tater Hill Lake (Whitener 1949). After a period of extremely heavy rainfall in November, 1977, the Tater Hill Lake dam gave way, with catastrophic results along Howard Creek. The lake remained drained, and the upper branches of the creek have reverted to some semblance of their previously normal flow patterns, although the surrounding areas remains highly impacted.

A community similar to Cranberry or Shulls Mills did not develop at Flatwoods in response to its function as terminus of the rail line. The fundamental difference was that Cranberry's iron mine and Shulls Mills' lumber mill were the destinations of the rail network (and derived product shipping points to destination markets), while Flatwoods was at the end of the spur line constructed to collect timber for transport to the mill. Flatwoods was not functioning in the same spatial and transportation manner as a mine, bloomery, or mill. The area was never extensively settled in the first place. Flatwoods' proximity to the long-established community of Meat Camp, the predominance of large-acreage family farms, and the relatively easy access to the worksite by local residents probably operated as factors to inhibit development of a distinct and separate community. World War I and the influenza epidemic of 1918 likely were secondary factors in the lack



of overall community development during the time Flatwoods served as the terminus of Whiting's Rich Mountain rail line. Several dwellings, now long abandoned, are situated along the old road leading out of Flatwoods towards Meat Camp. It is uncertain whether these may have pre-dated the railroad at Flatwoods or whether they may have represented minor residual related habitation after the 1920s.

A baseball field (regulation diamond) existed in Flatwoods until the late 1970s. Interest in baseball reached a peak in the late 1940s and early 1950s in Watauga County. Teams from Bamboo, Triplett, Boone, Blowing Rock, Foscoe, Valle Crucis ("Yankee Stadium"), Mabel, Elk, and Rich Mountain formed the Watauga County Baseball League. The diamond at Flatwoods was the Rich Mountain team's home field. The Foscoe ball field, still in use today, is located on the former property of the Boone Fork Lumber Company proximate to the old mill site. Many lumber mills and mill towns had company baseball teams in the early part of the twentieth century. It seems possible that the ball fields at Flatwoods and Foscoe may have had their origins during the logging days of the Boone Fork Lumber Company.

Today, Flatwoods is part of a 1,250-acre tract that includes virtually the entire area on and between Tater Hill, Harmon Knob, and upper Meat Camp Creek. Members of the Replogle family are the primary owners, having bought out Rich Mountain Associates, a group of Florida developers who acquired the property in 1969, but were unsuccessful in a second attempt to develop a resort. Apparently, the heirs of Romulus Z. Linney assembled this tract through accumulated acquisitions with Dr. H. McD. Little in the general Rich Mountain-Tater Hill area. Linney-Little properties figured prominently in timber rights along both branches (Rich Mountain area and Boone Fork out of Shulls

Mills) of William Whiting's Boone Fork Lumber Company logging railroads. Just recently, Appalachian State University acquired a portion of the Replogle property, including the Tater Hill Lake basin, and the property is being managed as an environmental research studies area by the Department of Biology.

### **Cranberry**

In its heyday, Cranberry, North Carolina, was a community of over 2,000 people and had running water and electricity by 1900 (Waite 1994). The company town of the Cranberry Iron & Coal Company, Cranberry had large grocery and dry good stores, along with general service industries, and was able to supply the needs of its sizeable population (about twice that of Shulls Mills at its height).

Cranberry was a hub of activity on the East Tennessee and Western North Carolina Railroad. Much of this activity, beginning in 1879 and peaking around 1892, was associated with the Cranberry Iron Mine. However, the ET & WNC was more than just an iron ore hauler and Cranberry was a major transfer point for the timber industry and an important destination for general freight.

Prior to 1899, lumber operations in the Cranberry area were small scale, providing timbers for the mines and lumber for local building construction. When the W.M. Ritter Lumber Company completed the Linville River Railroad from Pineola to Cranberry in 1899, the timber industry began to be a major source of revenue for the railroad (Cooper 1964). Cranberry became the center of this activity. Trainloads of lumber were brought into Cranberry from the Ritter bandsaw mill in Pineola. The lumber was transferred to the



East Tennessee and Western North Carolina Railroad for shipment to Elizabethton and Johnson City, Tennessee.

By 1912, when the Ritter company had ceased operations in Pineola, other lumber companies were beginning to operate around Cranberry and in areas made more accessible by the Linville River Railway. Up until about 1920, lumber from these mills was brought into Cranberry by wagon, truck, and rail. H.S. White Lumber Company built a band mill on the Elk River, north of Elk Park, and operated a narrow gauge logging railroad that interchanged with the ET & WNC between Elk Park and Cranberry (Dellinger 1975). White Lumber Company, Cannon Lumber Company, and the Whiting Lumber Company (at Shulls Mills) all brought their wood into Cranberry, where it would be stacked to dry before being shipped on the ET & WNC. These stacks of lumber filled the entire Cranberry Creek bottom north of the mine, depot, and company store (Waite 1994). Boone Fork Lumber Company operations in Shulls Mills stacked considerable amounts of lumber to dry right at the mill site, as well, then shipped this wood to Cranberry for redistribution or sometimes directly to other railheads in Elizabethton, Tennessee. Drying stacks of lumber were also common near Linville River Railway tracks in and around Boone as the result of Whiting's Boone Fork Lumber Company operations in the Rich Mountain area.

Once dry, the lumber was hand-loaded onto railroad cars and transported to the furniture and flooring factories in Johnson City, Tennessee, or to Elizabethton for rail distribution to regional markets. Forest products other than lumber also were brought into Cranberry by the local lumber companies. Tanbark, the bark peeled off hemlock and chestnut, was an important commodity. It would be packed into boxcars and shipped to

the tannery in Johnson City. Acid wood was shipped from Cranberry in gondolas. During the 1920s, large shipments of pulpwood for the paper industry left Cranberry on the railroad.

After World War I, when operations at the iron mine were intermittent, the population of Cranberry gradually declined. By the late 1920s, most iron mining operations had stopped. Cranberry today is a community of a couple hundred people with few reminders that it was once a thriving company town served by a vibrant narrow gauge railroad. Only a neighborhood row of original company housing on the main street (Highway 19E), the site and ruins of the iron mine itself, and the old railroad grade curving into town from what is now the highway from Elk Park remain. Community pride is still in evidence with the old Cranberry High School restored as a community center and recreation facility, adjacent to a new, modern elementary school.

### **Impact of Railroads and the Logging Industry**

When railroads across the mountains were finally completed in the late nineteenth and early twentieth centuries, the relative isolation of the southern Appalachian region gave way to increased trade and economic development. Easier access brought major changes to the life of people of the region. The opening of the southern Appalachians to large-scale lumbering, supported by logging railroad networks, dramatically changed the lives of the mountain people. The local population sold their small tracts of land to the lumber companies and then went to work for the companies. The local people built the railroads, cut the trees, and sawed the lumber.



The economic impact of logging in western North Carolina was tremendous. The sheer numbers of employed loggers, train crews, sawmill hands, and people of various other trades were significant. While most of the big lumber companies were not particularly generous, they did provide jobs in an impoverished region. The workers had adequate housing. Better schools were made possible through the company. The community buildings brought a little outside culture to the mountains through movies and dances. The railroad networks and the lumber industry were largely responsible for bringing the mountain people from the agrarian nineteenth century into the industrial twentieth century.

The Boone Fork Lumber Company mill helped support several communities in the early 1900s that were quite large for the period. These communities, in turn, contributed to the economic development of the area; even more importantly, they helped to open isolated areas of the mountain counties of western North Carolina. During the second decade of the twentieth century, Watauga County experienced an expansion of transportation and industry. William S. Whiting's Boone Fork Lumber Company and its network of logging rail lines created the growth of Shulls Mills and was directly responsible for the extension of the ET & WNC (Linville River Railway) into Boone. With the arrival of the railroad to Boone, the town grew rapidly. The lumber industry justified extending the tracks eastward; the train brought people, employment, and goods to the county.

## Chapter 7: Railroad Construction and Practices

The topography to be traversed is one of the most important matters in selecting railway routes. Engineers search out and survey these routes with great care, because the railroad must, if possible, avoid heavy grades and sharp curves. In rough country, valleys whose streams have graded their channels to easy slopes almost invariably are selected for railways. In new country, where forests were dense, the rivers were almost the only routes for explorers, traders, travelers, and settlers (Whitbeck 1931). In regions of mountainous topography, the river valleys provide the only feasible routes for railways.

Railroads have taken possession of just about every important river valley in the Appalachians. The early railways that obtained possession of such natural routes as the Mohawk Valley in New York, the Susquehanna-Juniata Valley in Pennsylvania, and the Potomac Valley between Maryland and Virginia, became the great trunk lines of the eastern United States (Ullman 1949). The New River Gorge through West Virginia and the course of the Nolichucky River in North Carolina are important routes through otherwise impassable mountainous topography of the mid- and southern Appalachian mountain chain. In the west, the natural route of the Royal Gorge of the Arkansas River afforded passage through the Front Range of the Rocky Mountains for early rail lines (Hilton 1990).

Low passes, or gaps, in mountain ridgelines also are of utmost importance to railway builders. In the western mountains, the railroads that got possession of the low



passes secured an advantage of access for major rail routes. The passes in the Alps have been important influences in determining the routes of several of the main railroads of central Europe (Whitbeck 1931). The same general principle holds true of railroad building in any mountainous region and was of specific importance in the route selection of William S. Whiting's logging rail lines.

After a route is selected, the construction of a railroad is largely a process of grading; that is, cutting and filling. The railroad generally follows topographical contours, but in many places the contours are smoothed by excavations (or cuts) and embankments (fills). The roadbed, which is also called the subgrade, must be carefully prepared before track is laid. To ensure stability, fills are built up in layers, each layer of earth, gravel, or other material being packed down thoroughly before the next is added. The sides of both cuts and fills must slope gently enough to prevent slides, the angle depending on the type of material; the sides may be relatively steep if a cut is made through stone. To minimize erosion that might lead to cave-ins, earth sides are often covered with sod or a thick layer of cinders (Anderson 1994). Once established, the right-of-way became part of the topography. Old roadbeds constitute the major relict evidence indicating the routes of the temporary logging rail lines.

When the Pennsylvania Railroad was being built, the chief engineer estimated that on the level stretches the road could be built for \$10,000 a mile, on the western slope of the Alleghenies for \$28,000 a mile, and on the very steep eastern slope for \$50,000 a mile. A 40-mile section of the railway over the Alleghenies cost nearly twice as much as a 60-mile section along a river valley (Whitbeck 1931). The extra cost of rail lines in steep terrain did not end when the line was built, for every heavy train that passed over

this mountain division required one or more extra locomotives, thereby adding to the cost of transportation.

Original construction costs are weighed against anticipated operating costs and revenues. Original costs were usually kept low, because railroads in the United States were built largely before the economy of the country was fully developed (Krause 1983). Extensive improvements have been necessary in recent years to strengthen roadbeds and eliminate or reduce sharp curves and heavy grades to permit higher speeds, heavier loads, and more frequent operation of trains.

### **Narrow-Gauge Practice and Logging Railroads**

Not all railroads were the same size. It was often less expensive to build the locomotives and the rolling stock a bit smaller, so track curves could be tighter. The spacing of the rails was reduced proportionately to the size of the equipment, to something narrower than the standard rail gauge of 4 feet, 8½ inches between the tops of the rails (Krause 1983). The most common narrow-gauge was 3 feet between the rails. The principal use of narrow gauge in the United States was as secondary railway systems in mountainous and sparsely populated areas. Narrow-gauge railroads were constructed in the mountains for more efficient access to coal, metal ores, and timber.

The advantages of narrow-gauge construction were exemplified by use in mountainous terrain. Diminished grading needs due to a narrower roadbed, lighter rail, and smaller locomotives and rolling stock made for lower overall construction and operating costs. Narrower track meant that tighter curves could be utilized, and lighter trains could pull steeper grades (Goforth 1989; Poole 1995). Route design challenges



involved not only the severity of grades and curves, but their frequency as well. Pioneer railway engineer Robert Fairlie's basic concept of the surface line closely following land contours implied many tight curves and frequent grade variation, especially in mountainous terrain. The concept of closely following contours implies that narrow-gauge lines should have few tunnels. These principles and advantages were pushed to practical limits in creative and ingenious ways in negotiating the early Doe River Gorge section of the East Tennessee & Western North Carolina Railroad line (Figure 13).

Early narrow-gauge track construction was based on 30-pound (per linear foot) rail with ties six feet long. Standard-gauge lines might use 50- to 60-pound rail. Short ties were basic to narrow-gauge technology, for they allowed the narrower cuts and embankments that were seen as major cost savings in the system (Krause 1983). The temporary nature of most logging lines allowed for the use of rougher, more makeshift ties placed at greater intervals. The lightest weight in which T-rail is regularly rolled is 12-pound rail. Such rail is two inches high, with a one-inch web and a two-inch base. Ballast was used sparingly on logging lines or dispensed with entirely; when used, ballast often consisted of rough rock collected on site.

The effort to conform closely to the contours of the land without heavy grading led to many small bridges or trestles as the route of the rail lines negotiated depressions, undulations, stream crossings, and reentrants. The greatest damage suffered by roadbeds was caused by water. The way in which railroads dealt with water depended on the source of the water, the position of the water in relationship to the right-of-way, and the time period the physical improvement was made (Anderson 1994). In cuts, and sometimes on fills, the shoulders of the roadbed were bordered by drainage ditches.



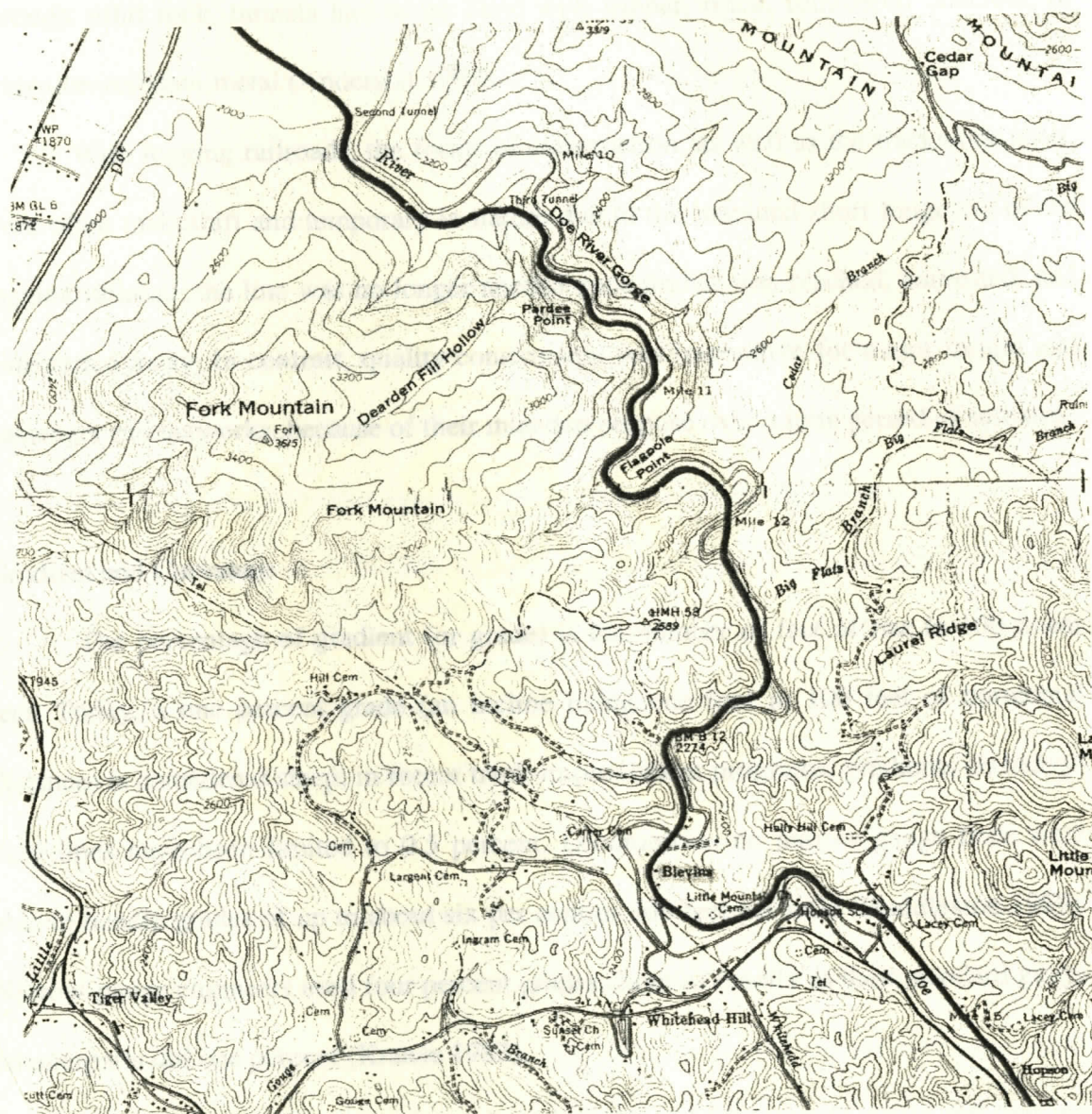


Figure 13: East Tennessee & Western North Carolina route through the Doe River Gorge. (Note tunnels, bridges, and general steep topography along the river).



Where the route crossed depressions deeper than 50 to 60 feet, trestles, bridges, or viaducts were commonly used instead of fills. Tunnels were extremely expensive and were avoided when the track could be routed around a hill or mountain. Unless cut through solid rock, tunnels had to be lined with timber, brick, reinforced concrete, or corrosion-resistant metal (Anderson 1994).

With logging railroads, the forms of construction, as well as the trackwork itself, were often makeshift and temporary in nature due to the intended short longevity of the logging railroad; the line was no longer needed once timber was reached, harvested, and transported away. In contrast, quality construction was imperative for major freight and passenger rail networks, because of their intended purpose over a long period of safe use.

### **Gradient and Curvature**

The percentage of gradient (or grade) is the number of feet of rise in 100 linear feet. Today, a one percent grade (an incline rising one foot in 100 feet of horizontal distance) is considered steep; in recent track-improvement programs, gradients on heavy-duty lines have been limited to 0.5 percent. Locomotives on narrow-gauge lines were able to handle grades of up to about six per cent or 300 feet per mile (Huddleston 1989). Narrow-gauge engineers used four percent grades about as readily as their standard gauge counterparts did one percent (Krause 1983).

Regional examples of track gradient include: a 1.2% average grade (60 feet per mile) on the Clinchfield Railroad, a standard-gauge line with long, heavy coal trains (Goforth 1989); and a three-mile long stretch of 4.7% grade (250 feet per mile) on Southern Railway track, also standard gauge, up Saluda Mountain from Saluda, North

Carolina, to Asheville (Poole 1995). The 4.7% grade is considered extreme, and several times the acceptable grade for American railroads. Opened on July 1, 1878, by the Southern Railway (now part of the Norfolk Southern system), the Saluda Grade was considered to be the nation's steepest mainline. The line became notorious in the late 1800s and early 1900s as the scene of horrific derailments that claimed many lives. A narrow spot between embankments at the bottom of the grade earned the nickname "Slaughter Pen Cut" for the numerous pileups (Poole 1995). Better braking systems and the addition of runaway-train safety tracks have helped eliminate derailments over the past 30 years. This section of mainline was taken out of service in 2002 after almost 125 years of use; maintaining safety on such a steep grade was too challenging, and other rail routes have been developed that can avoid this section of the Appalachian chain.

Grades as steep as 5.3% (280 feet per mile) on the narrow-gauge East Tennessee & Western North Carolina Railroad were utilized on the climb to the state line from the town of Roan Mountain, Tennessee, to Elk Park, North Carolina, and on the final section of the ascent of the Linville River Railway into Boone from the Watauga River to Hodges Gap (Ford 1994).

Switchbacks were constructed so trains could gain or lose elevation more gradually on steeper terrain where it was unsuitable for simple curves to do so. Locomotives on logging railroad lines were required to be able to both pull and push trains when utilizing switchbacks. True switchbacks involve switching the train to separate sections of track. In switchbacked curves, trains remain on the same track and do not change direction as they negotiate the tightest possible curves for the terrain. At the limit of curvature, true switchbacks must be used. Wye track arrangements (Figure 14)



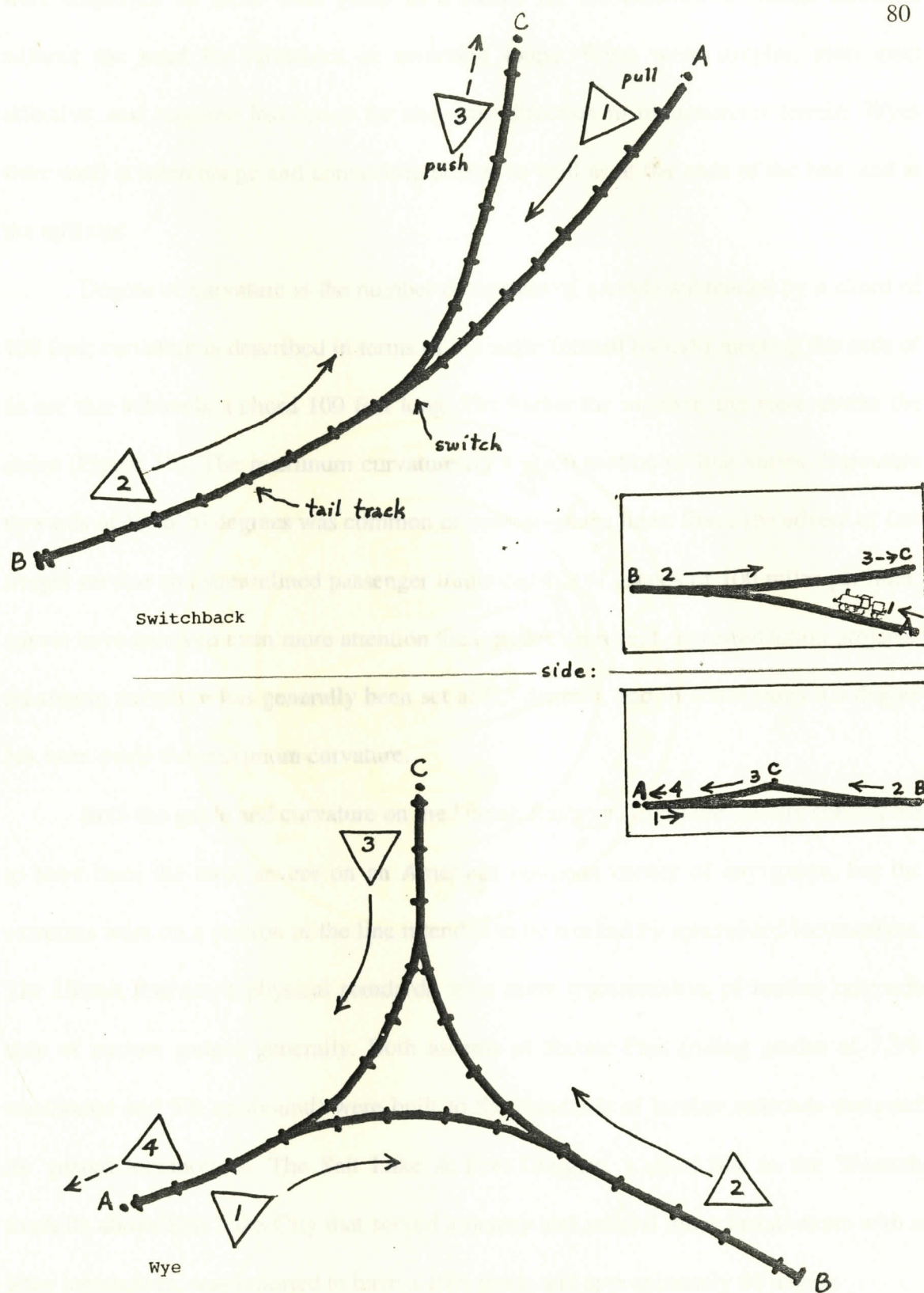


Figure 14: Switchback and Wye track arrangements.

were employed on more level grade as a means for locomotives to change direction without the need for turntables or reversing loops. Wyes were simpler, more cost effective, and required less space for changing direction in mountainous terrain. Wyes were used at interchange and connecting points, as well as at the ends of the line, and at the mill site.

Degree of curvature is the number of degrees of a circle subtended by a chord of 100 feet; curvature is described in terms of the angle formed by radii meeting the ends of an arc that subtends a chord 100 feet long. The higher the number, the more severe the curve (Figure 15). The maximum curvature on a given section of line varies. Curvature upwards of 10 to 20 degrees was common on narrow-gauge lines. Since the advent of fast freight service and streamlined passenger trains capable of speeds of 100 miles per hour, curves have received even more attention than grades. In recent curve-reduction projects, maximum curvature has generally been set at 1.5 degrees, and in some cases 0.5 degree has been made the maximum curvature.

Both the grade and curvature on the Uintah Railway (Utah) are usually considered to have been the most severe on an American common carrier of any gauge, but the extremes were on a portion of the line intended to be worked by specialized locomotives. The Uintah Railway's physical standards were more representative of lumber railroads than of narrow gauges generally. Both ascents of Baxter Pass (ruling grades of 7.5% westbound and 5% eastbound) were built to the standards of lumber railroads designed for geared locomotives. The Salt Lake & Fort Douglas, a short line in the Wasatch foothills above Salt Lake City that served a quarry and several other installations with a Shay locomotive, was reported to have a 10% grade and approximately 80 degree



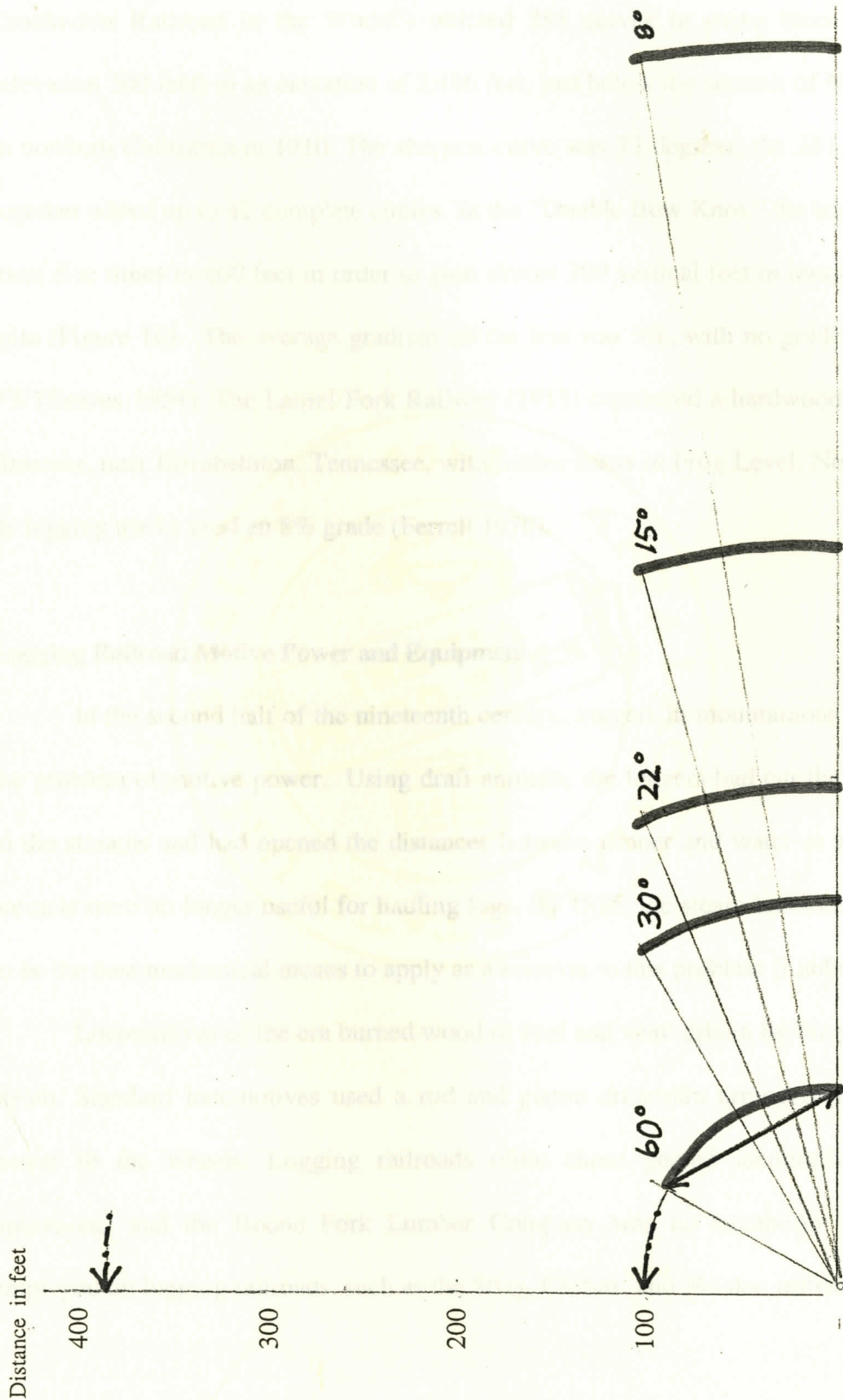


Figure 15: Curvature. A 60 degree curve can accomplish a 90 degree turn in one-fourth the distance than a 15 degree curve can.

curvature (Hilton 1990). The Mt. Tamalpais & Muir Wood Railway (dubbed "The Crookedest Railroad in the World") utilized 281 curves in rising from Mill Valley (elevation 300 feet) to an elevation of 2,486 feet, just below the summit of Mt. Tamalpais in northern California in 1910. The sharpest curve was 72 degrees; the 281 curves taken together added up to 42 complete circles. In the "Double Bow Knot," the track paralleled itself five times in 600 feet in order to gain almost 200 vertical feet in less than one-half mile (Figure 16). The average gradient on the line was 5%, with no grade steeper than 7% (Graves 1954). The Laurel Fork Railway (1913) connected a hardwood band mill at Braemar, near Elizabethton, Tennessee, with timber tracts in Frog Level, North Carolina; its logging tracks used an 8% grade (Ferrell 1976).

### **Logging Railroad Motive Power and Equipment**

In the second half of the nineteenth century, loggers in mountainous terrain faced the problem of motive power. Using draft animals, the loggers had cut the timber close to the streams and had opened the distances between timber and water to an extent that animals were no longer useful for hauling logs. By 1875, the steam locomotive was seen to be the best mechanical means to apply as a solution to this problem (Labbe 1984).

Locomotives of the era burned wood or coal and were driven by the production of steam. Standard locomotives used a rod and piston drivetrain arrangement to transfer power to the wheels. Logging railroads often chose geared locomotives for their operations, and the Boone Fork Lumber Company was no exception. Locomotives employed on logging railroads, such as the Shay, Climax, and Heisler, utilized a unique



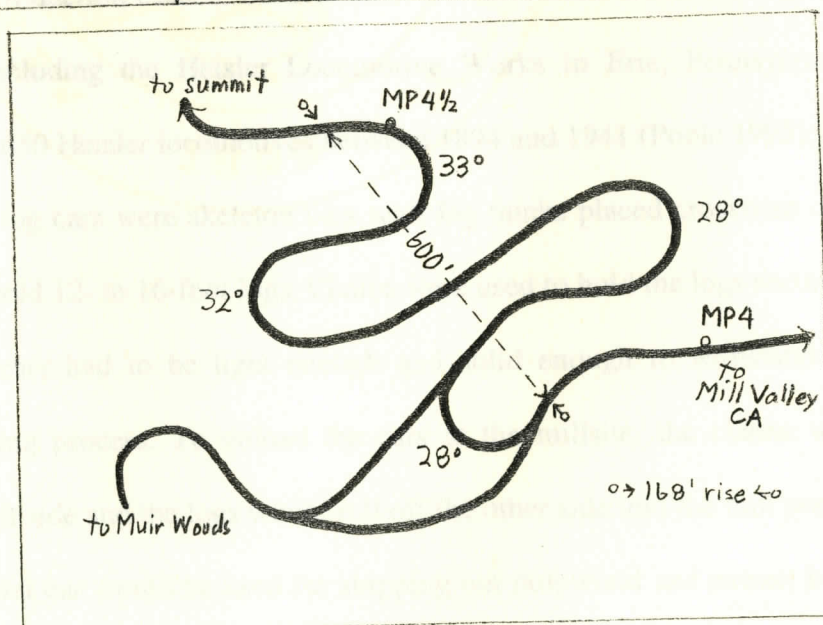
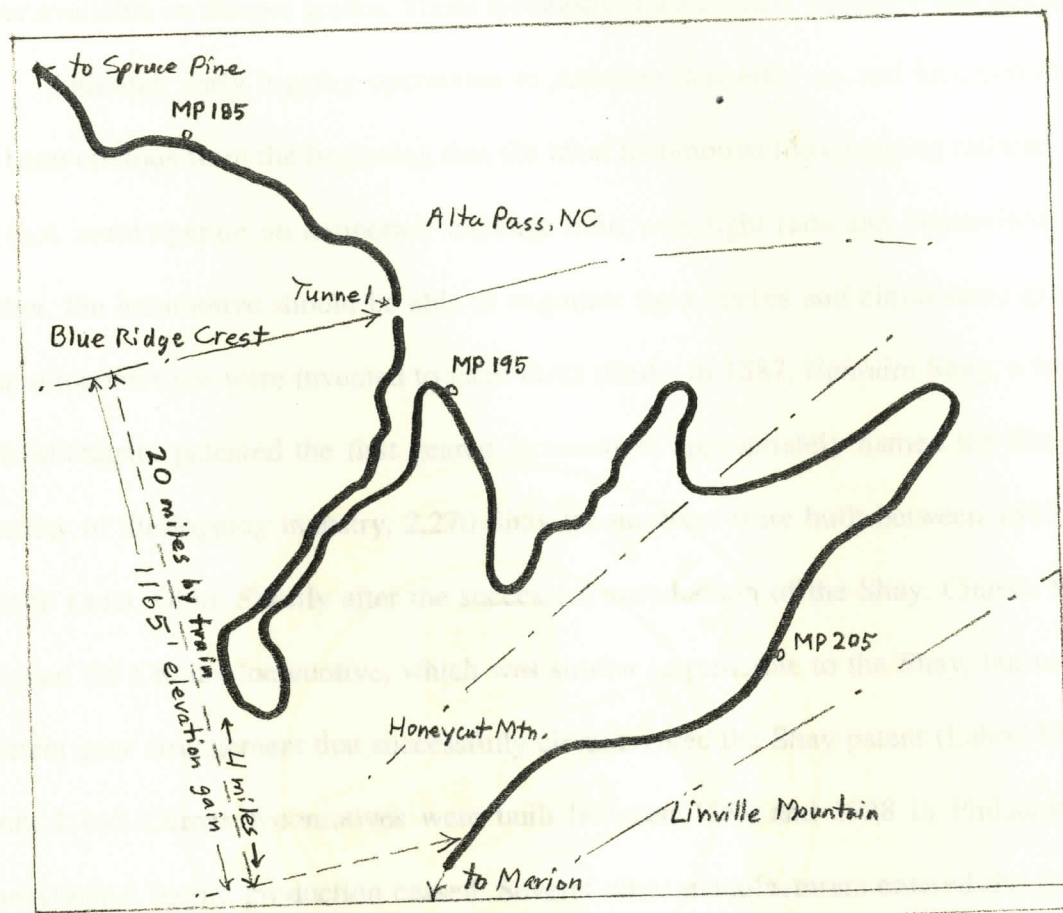


Figure 16: The Blue Ridge Loops (top) and the Double Bow-Knot.

gear mechanism to power drive wheels. This system made increased traction, torque, and power available on steeper grades. These locomotives were small, compact, and sturdy.

Although early logging operations in America depended on rod locomotives, it had been obvious from the beginning that the ideal locomotive for a logging railroad was one that could operate on temporary trackage built with light rails and improvised ties. Further, the locomotive should be able to negotiate tight curves and climb steep grades. Geared locomotives were invented to meet these needs. In 1887, Ephraim Shay, a logger from Michigan, patented the first geared locomotive, appropriately named the Shay. A mainstay of the logging industry, 2,270 Shay locomotives were built between 1887 and 1945 in Lima, Ohio. Shortly after the successful introduction of the Shay, Charles Scott designed the Climax locomotive, which was similar in principle to the Shay, but used a different gear arrangement that successfully circumvented the Shay patent (Labbe 1994). About 1,145 Climax locomotives were built between 1888 and 1928 in Philadelphia, Pennsylvania, before production ceased. Several other manufacturers entered the geared locomotive market, including the Heisler Locomotive Works in Erie, Pennsylvania, which produced about 650 Heisler locomotives between 1894 and 1941 (Poole 1995).

Narrow-gauge log cars were skeleton cars with log bunks placed crosswise over each truck, spaced to hold 12- to 16-foot logs. Chains were used to hold the logs securely. The simple skeleton cars had to be light enough and solid enough to withstand the treatment of the loading process. To unload the cars at the millsite, the chains were released from the uphill side and the logs would roll off the other side into the mill pond.

A gondola or flat car would be used for shipping out pulpwood and extract bark, and for shipping in hay and coal for the woods camps. This rolling stock also was used



for moving rails and ties as the rail line itself was extended or relocated. Special cars, such as water cars, often were built from a modified skeleton log car.

### **Boone Fork Lumber Company Rail Line Specifics**

Like most logging railroads, William S. Whiting's rail lines were constructed as cheaply as possible, were lightly built, and designed for slow speeds. In typical logging railroad practice on the scale of Whiting's operation, the woods-train crew was responsible for locating and building temporary railroad spurs into the stands of timber over a manageable route. The route usually followed creeks so the logs could be hauled to trackside from the creek's watershed. At times, tracks had to be built over a ridge into another watershed. Switchbacks were used to negotiate the steepest hillsides at an acceptable grade. The woods-track crew foreman determined where the spur tracks were to be built. The rudimentary roadbed of the spur was constructed largely by hand; 10-15 workers called graders used shovels to construct the spur roadbeds. A bridge crew built simple cribbed-log bridges where necessary to span short depressions. The steel-laying crew, composed of another 10-15 men, set the hand-hewn ties and spiked down the rails. This same crew would eventually be responsible for tearing up the track when it was no longer needed so that it could be used to construct another spur.

The Boone Fork Lumber Company rail lines were built prior to the advent of modern grading and earthmoving machinery. Grading of the roadbed and track laying were accomplished primarily by hand labor. Picks and shovels were used for excavating. Mules pulled drags for grading. Two-wheel dump carts carried away the overburden. The invention of the steam shovel facilitated later Whiting rail line construction and created

enhanced possibilities for increased access to timber-bearing terrain. Steam shovels were equipped to move over the rails and were utilized to grade right-of-way directly from the end of previously laid trackwork.

Drainage and stream crossings presented the major engineering challenges in the construction of most logging railroads, including Whiting's rail lines. There were three major water drainage problems: wet springs due to run-off from heavy rains, small creek branches, and small rivers (Anderson 1994). Crossings were made by wooden trestles, the use of culverts, or fill. Available timber was used for small bridges, trestles, and culverts. Logs were dropped across gaps and their tops flattened to function as bridge stringers; often, track was laid directly on them. Hemlock was often used for this purpose because of its low market value. Tracks crossing streams were sometimes supported in the center by timber cribs filled with rocks. Certain combinations of topography and expediency created situations where track was laid directly through a small stream, much as a wagon road would negotiate a small ford. Trestle construction was sometimes used to span sheer lateral edges of creekbeds parallel to the stream in steep narrow passages. There were no tunnels constructed on the routes of Boone Fork Lumber Company logging railroad lines.

Thirty-pound rail was utilized on Whiting's rail lines. The use of rough rock collected on site for ballast was typical on Whiting's rail lines. Average grade on the Boone Fork branch of the Boone Fork Lumber Company railroad was 2.7% (140 feet per mile). Maximum sustained grade (Figure 17) on the line was 4.7% (250 feet per mile). Average grade on the Rich Mountain-Howard Creek branch was slightly steeper at 3.3%



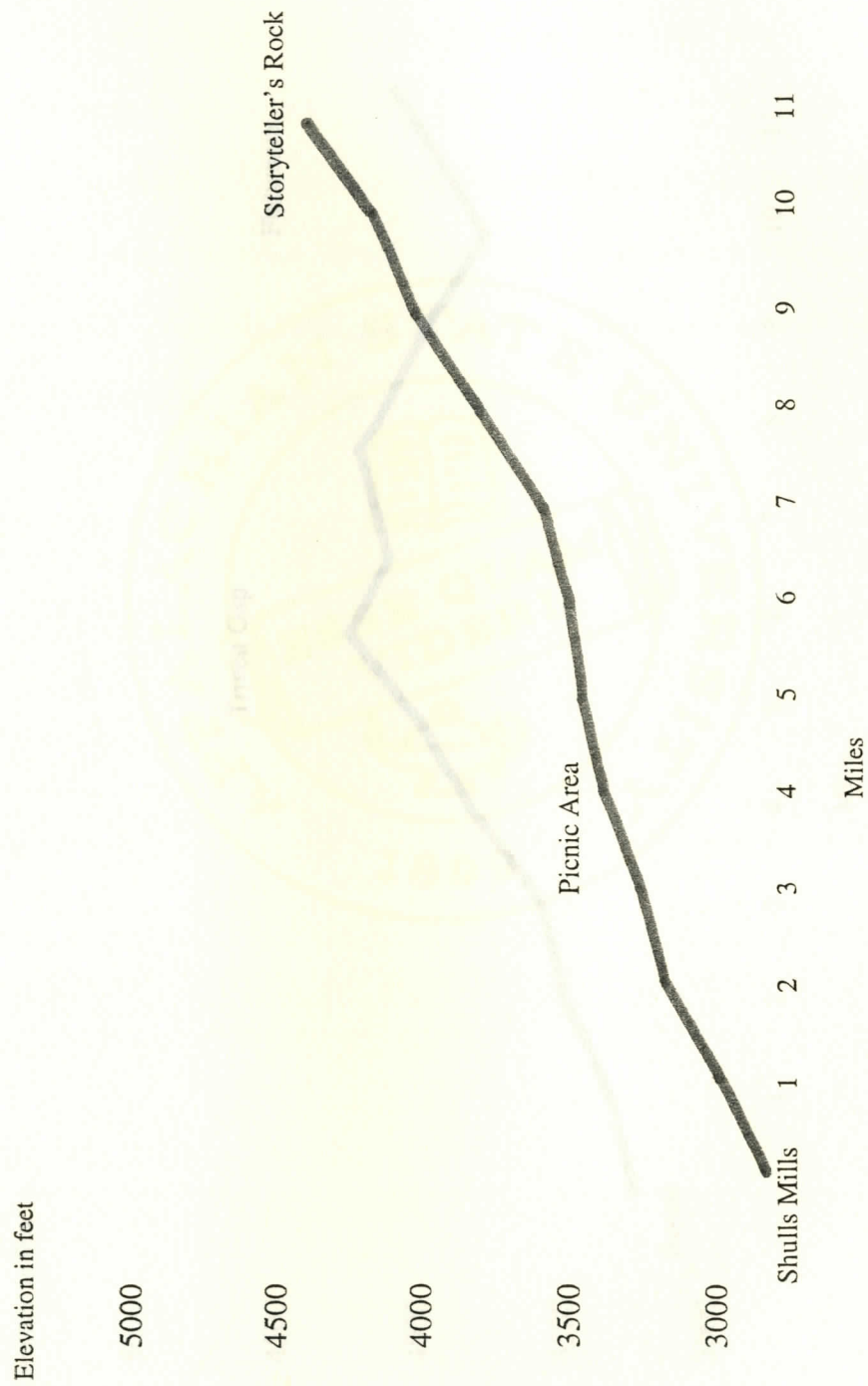


Figure 17: Elevation Profile -- Boone Fork Lumber Company Railroad, Boone Fork Branch

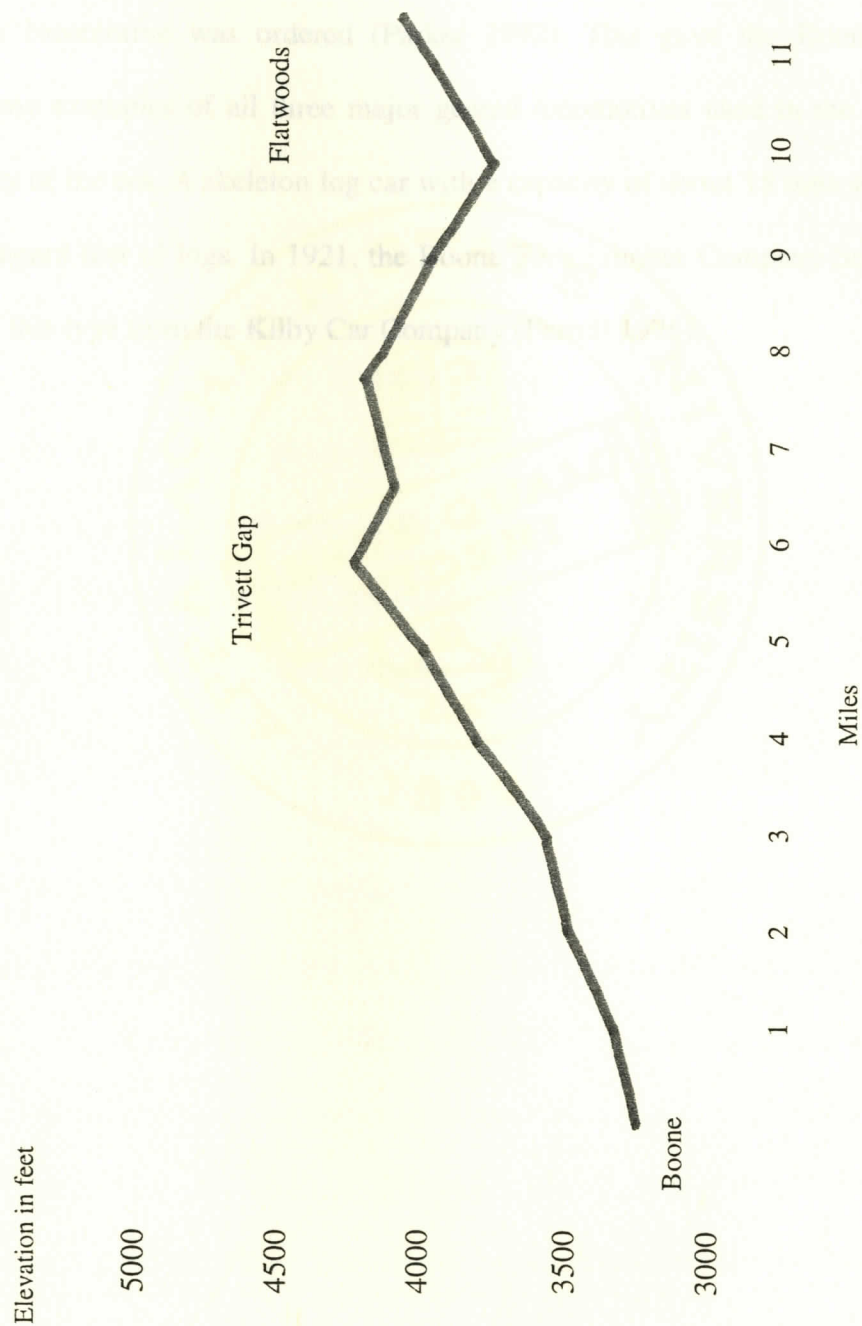


Figure 18: Elevation Profile – Boone Fork Lumber Company Railroad, Rich Mountain Branch



(175 feet per mile); maximum grade on the line was also 4.7% (Figure 18). Typical curvature on Whiting logging lines was up to 32 degrees.

Several Shay geared locomotives were used on Boone Fork Lumber Company track by 1917. A Climax locomotive was on the property, but was in service only part of the time. The company continued to prosper for several years and in 1920 a new 32-ton Heisler locomotive was ordered (Parker 1992). This gave the Boone Fork Lumber Company examples of all three major geared locomotives used in the logging railroad industry of the era. A skeleton log car with a capacity of about 15 tons would hold about 2,000 board feet of logs. In 1921, the Boone Fork Lumber Company bought 10 logging cars of this type from the Kilby Car Company (Ferrell 1976).

## **Chapter 8: Route Descriptions of the Boone Fork Lumber Company Rail Lines**

### **Boone Fork Branch: Shulls Mills to Storytellers Rock**

The Boone Fork branch roadbed begins at the site of the former Boone Fork Lumber Company band sawmill on the west bank of the Watauga River at Shulls Mills, at an elevation 2,800 feet above sea level (Figure 19). The old roadbed lies on the flat expanse of floodplain just south of what is now the entrance to the gated community development of Hound Ears Club, Ltd.

The line crossed the Watauga River just downstream of the Boone Fork confluence and continued along the east bank of Boone Fork Creek for about a mile before crossing to the west side of the drainage. The property plat of the Boone Fork Lumber Company (from Watauga County records) shows the railroad line's specific route from the mill to its entrance into the drainage of Boone Fork Creek (Figure 20).

As the sides of the valley steepen, the route rises above the creek to a crossing at Bee Tree Creek. The common route of the Boone Fork Trail (National Park Service) and the Mountains to Sea Trail, entering from the Bee Tree Creek drainage, uses the graded roadbed at this point. These two trails continue sharing the route of the railroad grade upstream along Boone Fork from the point that Bee Tree Creek joins Boone Fork Creek.

The route follows a fairly gentle grade well above the creek. A survey of the obvious larger trees now in the roadbed suggests the trees developed after the removal of the system and its tracks from this section; in fact, these trees are approximately 60-70



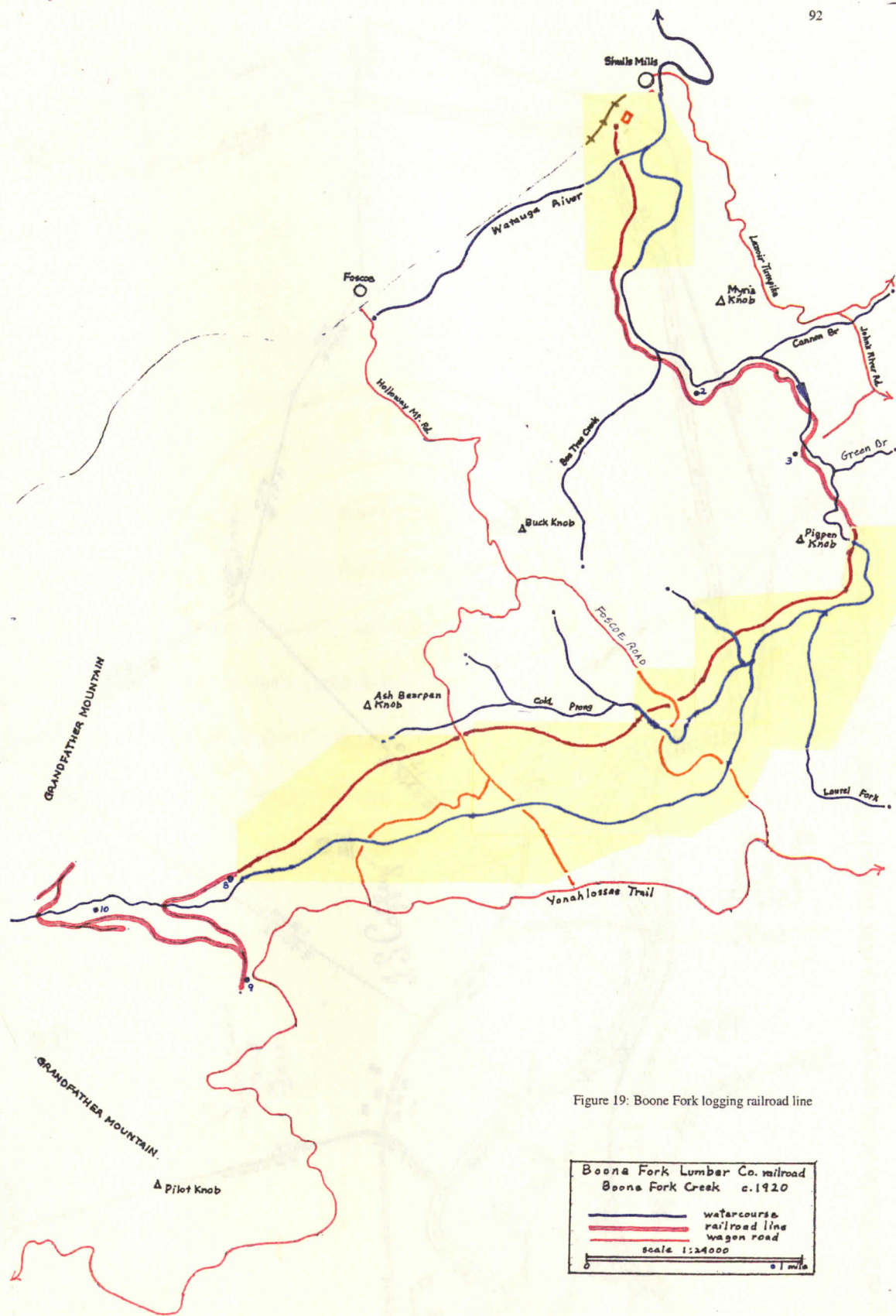


Figure 19: Boone Fork logging railroad line

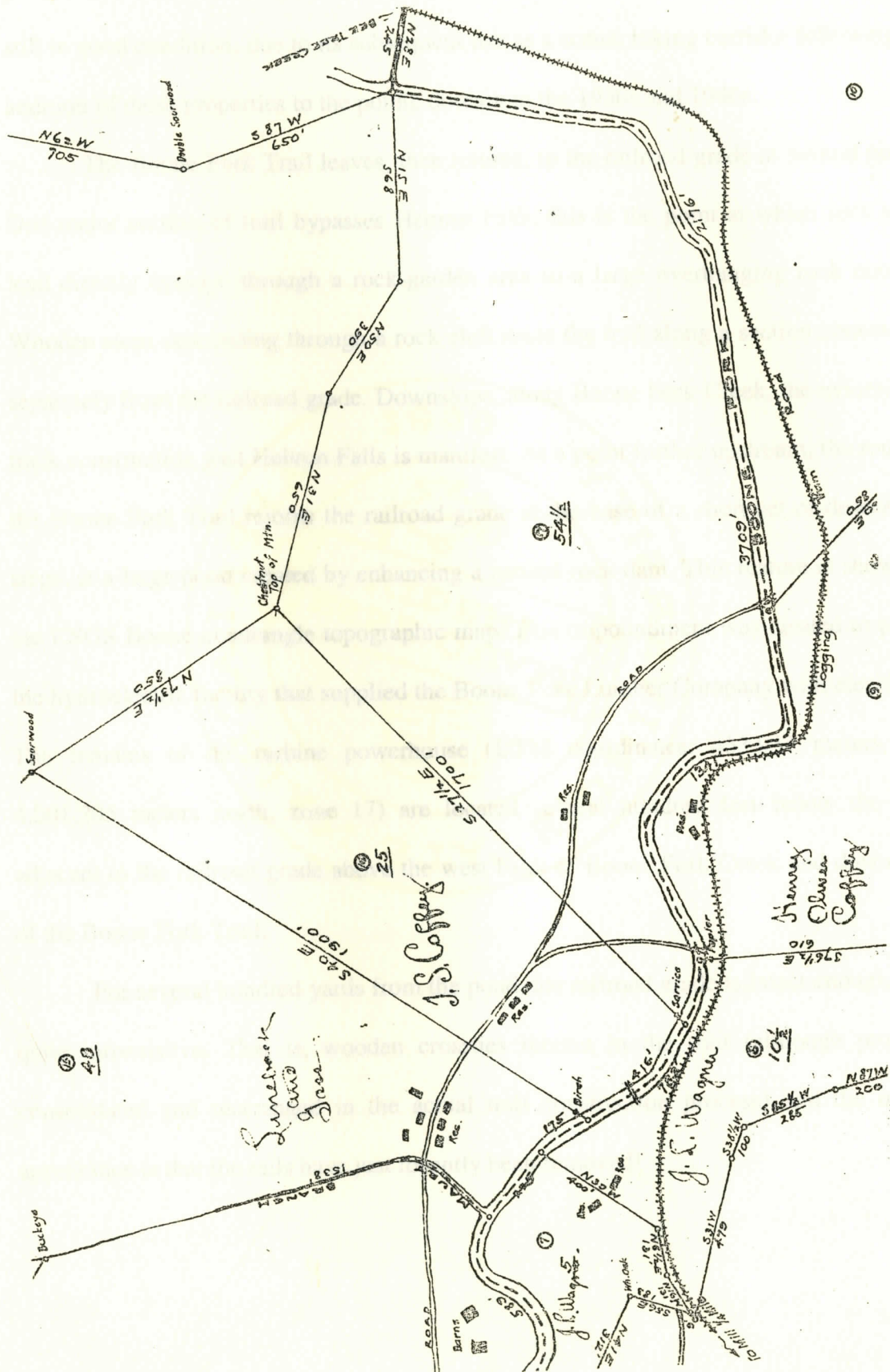


Figure 20: Shulls Mills area property plat map c. 1921 from Watauga County Register of Deeds.



years old. This fairly straightforward run of railroad grade, at approximately 3.8%, is still in good condition, due to its subsequent use as a scenic hiking corridor following the addition of these properties to the public domain in the 1930s and 1940s.

The Boone Fork Trail leaves, then returns, to the railroad grade at several points. One major section of trail bypasses Hebron Falls; this is the point at which rock stairs lead directly upslope through a rock-garden area to a large overhanging rock outcrop. Wooden steps descending through a rock cleft route the trail along a section constructed separately from the railroad grade. Downslope, along Boone Fork Creek, the evidence of track construction past Hebron Falls is manifest. At a point further upstream, the route of the Boone Fork Trail rejoins the railroad grade at the base of a short set of descending steps, at a large pond created by enhancing a natural rock dam. This feature is shown on the USGS Boone quadrangle topographic map. This impoundment was created to power the hydroelectric facility that supplied the Boone Fork Lumber Company with electricity. The remains of the turbine powerhouse (UTM coordinates: 433,953 meters east, 4,001,205 meters north, zone 17) are located several hundred feet below the dam, adjacent to the railroad grade above the west bank of Boone Fork Creek and downslope of the Boone Fork Trail.

For several hundred yards from the pond, the railroad grade is intact enough to be quite informative. That is, wooden crossties remain in the trail (although probably consolidated and rearranged in the actual trail construction process) and the overall appearance is that the rails have just recently been removed!

The track would have passed the confluence with Green Branch and in this vicinity the general route of the railroad grade crosses Boone Fork Creek once again to the east bank where the Mountains-to-Sea Trail diverges from the Boone Fork Trail. Through this transition area, the route emerges from the steep-sided valley onto gentler terrain at the north end of what is now Price Park picnic area. This area has been heavily impacted by the resurgence of its beaver population. Most logically, the route would have remained on the west bank after skirting the last major boulder rock obstacle to access the "old lakebed " area on its way to the present-day Price Lake. The route appears to cross Sims Creek and continues to the south end of the picnic area. This obvious section of intact railroad grade is revealed by present-day patterns of lesser use at this margin of the very popular picnic area. The roadbed passes more beaver habitat on the creek and leads to the dam on Price Lake, built in 1959. Here, the route becomes submerged beneath the western edge of Price Lake, located at the confluence of both Laurel Fork and Cold Prong with Boone Fork, five miles from Shulls Mills at an elevation of 3,400 feet. Within a mile past this point is the terminus of the first phase of this Whiting railroad branch, described as about six miles from the lumber mill.

The route of the expansion to access timber stands on Grandfather Mountain generally follows the Blue Ridge Parkway roadbed from the Price Lake area to Holloway Mountain Road (SR 1559). There is strong evidence of railroad grade between Holloway Mountain Road and the Calloway Peak View overlook on the Blue Ridge Parkway, along the north side of the Parkway just below the Cold Spring parking area. Crossing to the south side of the Parkway at BRP milepost 301, an obvious grade in the woods illustrates



a more railroad-like configuration; that is, narrower roadbed and tighter curves than that of the Parkway. The route rejoins the general Parkway grade to go uphill for about a mile before becoming evident again above the road cut on the north side of the road; this is where the Tanawha Trail (National Park Service) joins the route.

The Tanawha Trail utilizes the route of the railroad grade for several hundred yards, along which several excellent intact examples of the railroad grade can be seen; these examples are easily accessible from the Boone Fork parking area on the Blue Ridge Parkway. The roadbed leaves the route of the Tanawha Trail at a recognizable point uphill from the north end of the Boone Fork parking area and begins to contour into the Boone Fork Bowl, crossing the creek at about 4,000 feet elevation. Here is one of only three sections of steel rail discovered in many sessions of field work. Now on the south side of the creek, the route contours back towards the Tanawha Trail (which has crossed the Boone Fork Creek on the excellent wooden bridge downstream of the old railroad crossing). The railroad route crosses the Tanawha Trail and rises to a switchback at nine miles where it meets the Parkway once again. The rising part of the switchback crosses the Tanawha Trail at its junction with the Nuwati Trail (Grandfather Mountain). The Nuwati Trail follows the route of the rail line directly from this point up into Boone Fork Bowl, crossing three major side drainages on the north slope of the Pilot Ridge of Grandfather Mountain. A short spur track here accessed a small rock quarry site. The line ends near Storyteller's Rock at an elevation of 4,400 feet.

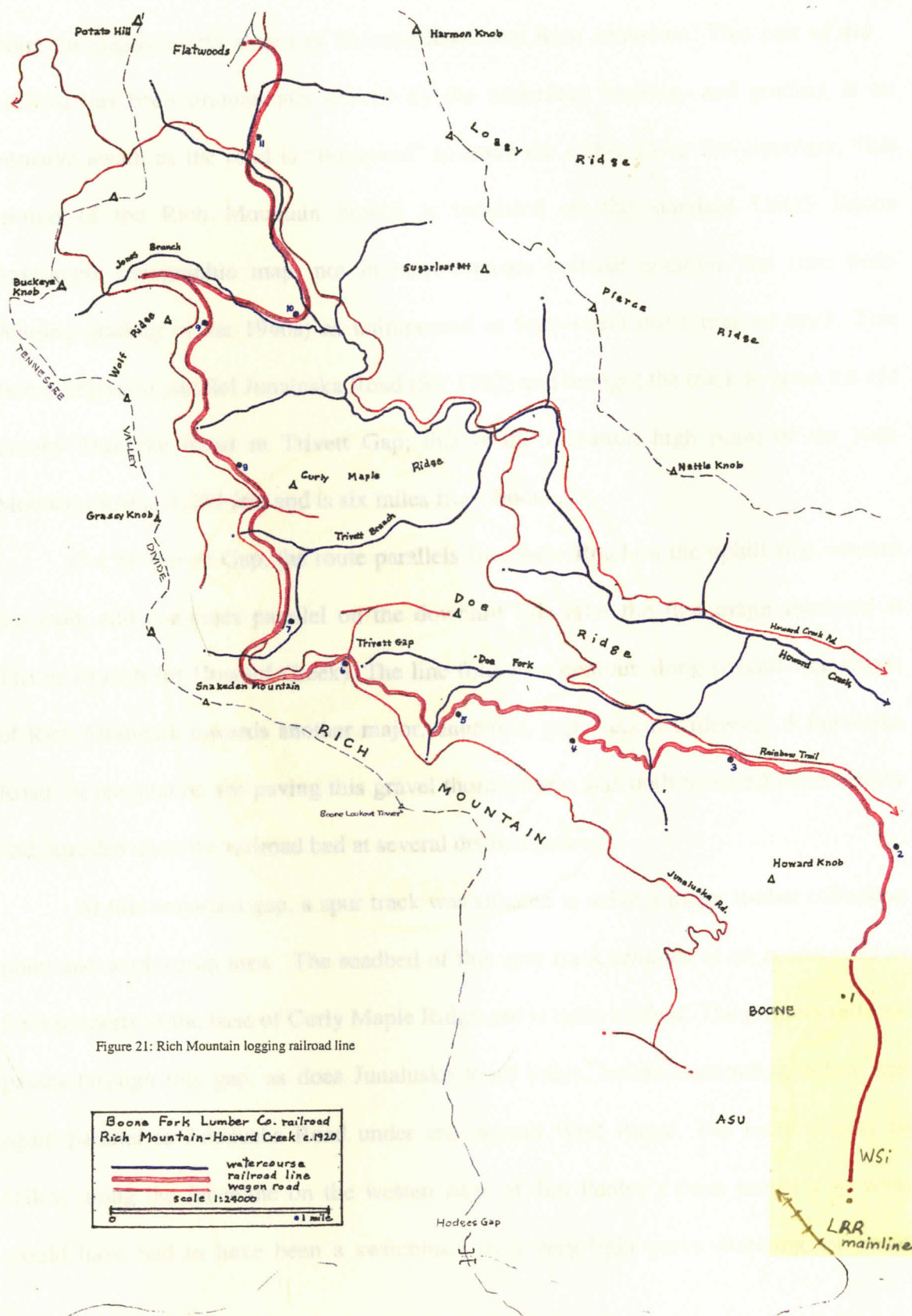
### **Rich Mountain Branch: Boone to Flatwoods**

This route, sometimes referred to as the "Whiting Railroad," branches off the mainline Linville River Railway track at what was known as Winkler's Siding. Winkler's Siding was one mile from the terminus of the Linville Railway line in Boone. Present-day Rivers Street (also known as Faculty Street) utilizes the route of the Linville Railway tracks through the Appalachian State University campus to Depot Street, the site of the railroad depot station and the Boone Wye. The location of the end of the line wye turnaround track is occupied by the University's new Student Recreation Center.

The Rich Mountain logging railroad branch roadbed leaves the vicinity of the intersection of Hardin Street and U.S. 321 in the general vicinity of the Holmes Convocation Center, and rises towards the north in the drainage immediately to the west of the Hillcrest neighborhood (Figure 21). At a point where the primary access road enters the John Councill subdivision on the lower southeast slope of Howard Knob, a gradual contour at the 3,400 foot level carried the track around the east side of Howard Knob. This old roadbed is interrupted several times by additional development and road construction above New Market Estates. The railroad grade is now utilized as Wake Robin Road (illustrating very typical narrow-gauge grade curvature), and connects to Rainbow Trail (State Route 1318) on the lower northeast slope of Howard Knob.

The line follows Rainbow Trail above and past the Appalachian State University water reservoir on Norris Branch to the old Rainbow Trail (Boone to Rich Mountain Road) turnoff. As Red Fox Road, then Cabin Cove Road, the railroad grade ascends seven hundred vertical feet over the next three miles above Doe Fork (of Howard Creek)





along the rugged north slopes of Howard Knob and Rich Mountain. This part of the roadbed has been dramatically altered by the widening, blasting, and grading in an intrusive swath as the road is "improved" to serve the Cabin Cove Development. This section of the Rich Mountain branch is indicated on the standard USGS Boone quadrangle topographic map, not in narrow-gauge railroad notation, but (due post-Whiting grading in the 1940s) as unimproved or four-wheel drive road or track. This ascent begins to parallel Junaluska Road (SR 1102) and brought the track to cross the old Linney Turnpike Road in Trivett Gap; this is the elevation high point of the Rich Mountain line at 4,250 feet and is six miles from Boone.

Out of Trivett Gap, the route parallels Junaluska Road on the uphill side, crosses the road, and continues parallel on the downhill side after the first major reentrant at Trivett Branch (of Howard Creek). The line follows a contour along several side slopes of Rich Mountain towards another major, unnamed, gap. Recent widening of Junaluska Road, in preparation for paving this gravel thoroughfare, has both revealed more clearly and intruded upon the railroad bed at several distinct points.

At this unnamed gap, a spur track was situated to serve a major timber collection point and work camp area. The roadbed of this spur track remains as an access road to farm property at the base of Curly Maple Ridge and is quite evident. The primary rail line passes through this gap, as does Junaluska Road today, before descending below and again parallel to Junaluska Road under and around Wolf Ridge. The route is easy to follow along the fenceline on the western edge of Jim Penley's farm property to what would have had to have been a switchback or a very tight curve directing the route



northward along Jones Branch (of Howard Creek). The tail track or route of the curve here is now Curly Maple Road (SR 1323), which connects Junaluska Road with Howard Creek Road, and which, curiously, is a major feature not noted on even recent revisions to the USGS Zionville quadrangle topographic map. This switchback or curve brings the roadbed into the low elevation point of this section of the route, where the major upper branches of Howard Creek begin to converge.

The line follows this branch section of Howard Creek below Curly Maple Road and Armon Cullar's house. The railroad grade crosses the road just south of its junction with Howard Creek Road (SR 1306). There are indications that a store and service structure have been remodeled for dwellings; these structures were here, at what may have been the end of Howard Creek road, at the time of the railroad operation. A rare population of Fringed gentian (*Gentiana crinita*) is found here at the edge of the road, right where the old railroad bed remains.

From this point, the roadbed follows Howard Creek upstream, crossing at several points by trestle and by culvert, then crosses Howard Creek Road before ascending along the final section of creek to the old Tater Hill dam and lakebed, the entrance to Flatwoods. A wye track (or a rudimentary turnaround mechanism) and other maintenance and support facilities would have existed at this rail terminus and primary timber collection point in the Flatwoods area, although no actual trace of the structures and facilities remains today.

## Chapter 9: Conclusion

William S. Whiting's Boone Fork Lumber Company logging railroads represented the maximum extent of rail lines of any kind into Watauga County, North Carolina. The extractive industries – mining and timber – brought railroad transportation to isolated areas of the southern Appalachian region. The exploitation of natural resources in the region came relatively late in the railroad transportation era of the United States. The remaining timber stands that the lumber barons found in the southern Appalachian forests were of enormous value. The topographical inaccessibility of the region had not only hindered the arrival of transportation systems, it had allowed the southern Appalachian forests to develop while timberlands were being logged out elsewhere in the United States.

Demand for wood products was high at the end of the nineteenth century. Industrial development and population growth fueled the need for wood for construction, the leather tanning industry was thriving, and wood pulp for the production of paper was in great demand. The technology of the railroad industry had developed to the point that innovative design and the utilization of narrow-gauge railroad systems and equipment allowed mechanical access to narrower river valleys and steeper terrain. The vast extent of the forests and the incredible variety of tree species in the mountains of the southern Appalachians justified capital investments for building logging railroad lines to reach timber stands, and for the construction of large bandsaw mills to turn that timber into



lumber products. A very profitable market drove the timber and lumber industry of the late nineteenth and early twentieth centuries.

Effective timber extraction methods, a large work force available in a region that had been impoverished as well as isolated, and the efficiency of the milling process quickly exhausted the timber resources of the southern Appalachian region, including those of Watauga County. The large lumber companies, with their mill complexes, left the region; company towns reverted to the smaller agricultural communities that preceded the logging era. Trucking and the development of highway systems began to take railroading out of the general transportation spotlight in the 1930s and 1940s (Figure 22). The great flood of August, 1940, destroyed most of the rail lines left in Watauga County. None of the rail lines were ever rebuilt.

William S. Whiting's lumber operations had a dramatic effect on Watauga County. His industry brought employment, enrichment, and prosperity to isolated communities. The railroad transportation system he helped extend into Watauga County allowed him to reach timber and transport lumber products to market. This rail network also opened transportation corridors that enabled modern highway systems to eventually reach Watauga County. The timber resources of the southern Appalachians were evident to those with the means to exploit them. Narrow-gauge railroad transportation technology enabled access. The local population provided the necessary labor for all aspects of the timber and lumber industry. These spatial and temporal intersections of physical and human geography helped bring Watauga County from the agrarian nineteenth century into the industrial twentieth century.

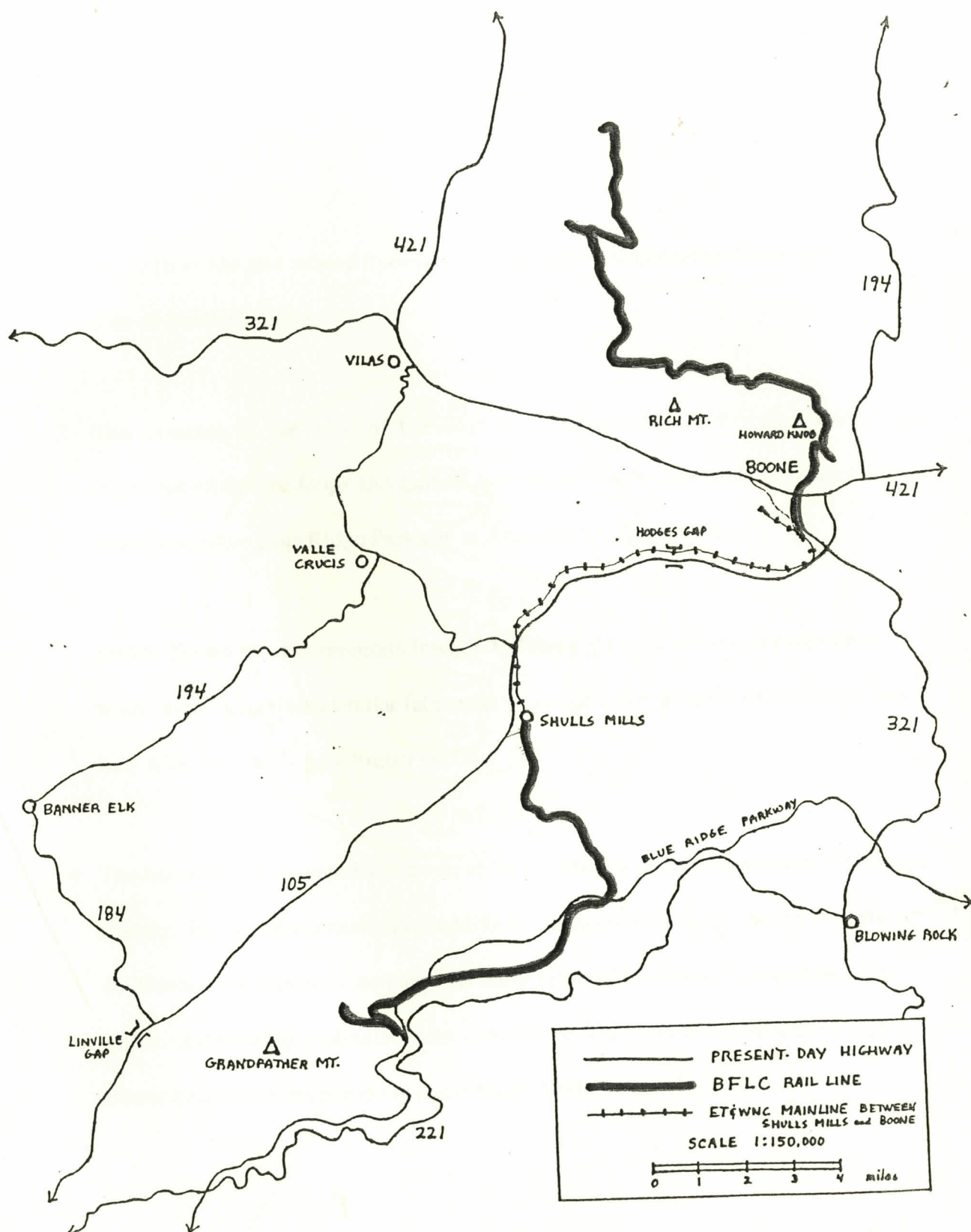


Figure 22: Boone Fork Lumber Company track shown with present-day highways.



### Endnotes

- 1 At the time, the area around Sycamore Shoals (TN) was considered to be part of the state of North Carolina.
- 2 This crossing of the crest of the Blue Ridge is accomplished with a daring and ingenious section of loops and tunnels in through North Cove and culminates with a tunnel under the Blue Ridge Parkway at Altapass, NC (Figure 16).
- 3 Butler, Tennessee, a community integral to Whiting's final venture decades later, would eventually find a similar fate under Watauga Lake, another TVA project, not long after the town's post-timber decline.
- 4 The name of this community is given as Shulls Mill on modern-day maps of Watauga County. The use of the name Shulls Mills is consistent with usage during the time of the Boone Fork Lumber Company; the name referred to the saw mill and the other earlier and existing grist mills in the community. The 1994 revision of the USGS Boone quadrangle reverts to the name Shulls Mills.

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## BIOGRAPHICAL INFORMATION

Joseph H. Quinn Jr. was born in Baltimore, Maryland, on October 20, 1949. He attended elementary and junior high schools in Westbury, New York, and graduated from Chaminade High School in Mineola, New York, in 1967. In May 1971, he graduated from Colgate University in Hamilton, New York, with an undergraduate degree in Psychology. Appalachian State University in Boone, North Carolina, awarded the Master of Arts in Geography in May 2003.

Mr. Quinn is an outdoor educator, classroom teacher, and geographical practitioner. He holds a State of North Carolina Teaching License for Middle Grades Math, Science, and Spanish. He has been an instructor and course director for the North Carolina Outward Bound School, and directed Outdoor Programs at Appalachian State University for thirteen years. Mountaineering has always been a passion for Mr. Quinn, and he has climbed major peaks throughout North and South America. His academic interests include the sacred geography of the Andean highlands and biogeography.

Married to Dale Harrington, a biologist, he has helped to raise two children and considers parenting to be his other major passion. He and Dale live on Doe Ridge, outside of Boone, and spend part of the year at the family outpost in Teton Valley, Idaho.



